URS

19 June 2006
Project No. 43346038.07901

Orica Australia Pty Ltd
16 - 20 Beauchamp Road
MATRAVILLE NSW 2036

Attention: Stephen Corish

Dear Stephen,

Subject: WCIE4302 –Southern Plumes Source Area Delineation Investigation - February 2006

1. Introduction

URS Australia Pty Ltd (URS) was contracted by Orica Australia Pty Ltd (Orica) to undertake further delineation investigation of the Central Plume DNAPL source area at the Botany Industrial Park (BIP). The investigation outlined in this letter follows on from investigation works outlined in the August 2005 Southern Plumes DNAPL Source Area Investigation Progress Report (URS, 2005).

Several groundwater monitoring locations were installed around the former Solvents Plant and former TCE Plant to attempt to delineate the upgradient boundary of the Southern Plumes dense non-aqueous phase liquid (DNAPL) source areas in the first half of 2005. The results of this investigation were reported in the August 2005 Southern Plumes DNAPL Source Area Investigation Progress Report (URS, 2005). Most of the monitoring locations reported concentrations of chlorinated hydrocarbons (CHCs) that indicated that they were located within, or downgradient of, the Southern Plumes source area. DNAPL was also identified at several locations confirming that some locations were located within a DNAPL source area.

Investigation works were also undertaken within the Botany Railway Corridor in the first half of 2005 in order to better understand the distribution of DNAPL in the subsurface within the Southern Plumes source areas. Soil analysis indicated that DNAPL may have been present in some samples collected within the rail corridor, primarily to the west of the former Solvents Plant and also to the west of the former TCE Plant. The results of this investigation were also reported in the August 2005 Southern Plumes DNAPL Source Area Investigation Progress Report (URS, 2005).

URS Australia Pty Ltd (ABN 46 000 691 690)
Level 3, 116 Miller Street
North Sydney, NSW 2060 Australia
Tel: 61 2 8925 5500
Fax: 61 2 8925 5555

The primary objectives of the work outlined in this letter were to:

- Establish the upgradient (north east) and lateral (south east and north west) boundaries of the DNAPL sources associated with past operation of the former Solvents Plant (the S2 source) and the former TCE Plant (the S3 source);
- Establish the northern boundary of a DNAPL source area located at Southlands-Block 1 (the S1 source), which is believed to be associated with operation and effluent disposal at the former Solvents Plant and the former TCE Plant; and
- Better characterise the S1, S2 and S3 source areas and/or dissolved phase plumes in the north west corner of Southlands-Block1.

2. Scope of Work

In order to meet the project objectives stated in Section 1 URS undertook the following work:

- BP103 and BP104 were installed along the northern boundary of Southlands-Block1. These wells were installed to assess the northern extent of the S1 source area. BP103 was installed to a depth of 27 m below ground level (bgl) with sample ports spaced at 2 m intervals between 1 and 27 m bgl. BP104 was installed to a depth of 25.5 m bgl, with sample ports spaced at 2 m intervals between 2 and 24 m bgl, and a sample port at 25.5m bgl;
- BP105 and BP106 were installed along the north east boundary of Southlands-Block 1 to better characterise dissolved phase contamination and/or DNAPL within the S1, S2 and S3 source areas. BP105 was installed to a depth of 22 m bgl, with sample ports spaced at 2 m intervals between 1 and 21 m bgl, and a sample port placed at 22 m bgl. BP106 was installed to a depth of 23 m bgl with sample ports spaced at 2 m intervals between 2 and 22 m bgl, and a sample port placed at 23 m bgl;
- WG210 was installed approximately 50 m to the north east of the former Solvents Plant to assess the upgradient extent of the S2 DNAPL source area. WG210 was installed as a nested monitoring well with screened intervals at 2 to 5 m, 7.5 to 13.5 m and 15.5 to 21.5 m bgl;
- WG212 was installed approximately 20 m to the south of the former TCE Plant to assess the lateral (south east) boundary of the S3 source area. WG212 was installed as a nested monitoring well with screened intervals at 2 to 5 m, 6 to 12 m and 13 to 19 m bgl;
- WG213 was installed approximately 150 m north west of the former Solvents Plant to assess the lateral (north west) boundary of the S2 source area. WG213 was installed as a nested monitoring well with screened intervals at 0.5 to 6.5 m, 8 to 14 m and 16 to 22 m bgl;

- Groundwater samples were collected from all newly installed monitoring wells and functioning bundle piezometer sample ports and were analysed in the laboratory for selected volatile and semi-volatile CHCs;
- Groundwater samples were also collected from the monitoring locations installed in the first half of 2005 to confirm the analytical results reported in the August 2005 Southern Plumes DNAPL Source Area Investigation Progress Report (URS, 2005). The monitoring locations sampled were BP90, WG204, WG205, WG206, WG207, WG208 and WG209;
- Collected 3 samples of NAPL from BP105 and 1 NAPL sample from MWD16 for compositional analysis.

Monitoring locations are presented in Figure 1.

It should be noted that two additional monitoring locations were proposed for this investigation. BP107 was to be installed within the Botany Rail Corridor to further assess the lateral (southern) extent of the S3 source area. The proposed location of BP107 was within the Botany Rail Corridor on land owned by Pacific National. Orica experienced difficulties negotiating access to the Pacific National site so the location was abandoned to ensure all other works could be completed within a timely manner.

WG211 was proposed to be installed approximately 50 metres to the north east of the former Solvents Plant and former TCE Plant to assess the upgradient extent of S2 and S3 source areas. The proposed location of WG211 was within a major operational loading bay on a Huntsman owned portion of the BIP (ie. on land that is not owned by Orica). This location was abandoned due to foreseeable difficulties with installation and sampling a well at this location. There were no alternative proximate locations to install WG211 due to the presence of Huntsman infrastructure.

A nested monitoring well (MWD16) was installed approximately 100 m to the north of the former Solvents Plant as part of the BIP hydraulic containment project. Evidence of CHC contamination, and potential DNAPL, was identified during the installation of MWD16. The findings at MWD16 are relevant to the assessment of the Southern Plumes source areas and are also discussed within this letter report.

3. Results

3.1 Field Observations

Borelogs and monitoring well / bundle piezometer construction logs are presented in Appendix A. It should be noted that the new monitoring locations were installed using mud rotary drilling techniques. As such, it was not possible to accurately log the lithology at each of the drilling locations. The information presented in the logs provided should be considered approximate only. The lithology encountered at each location appeared consistent with previous findings at the BIP and Southlands. Drilling cuttings indicated that sand was the dominant lithological feature down to a depth of approximately –18 m AHD, below which was dominated by peat, peaty clay, clayey peat

and weathered sandstone. Sandstone bedrock was encountered at depths ranging from –9 m AHD at WG212 to –23 m AHD at BP103. Strong chlorinated hydrocarbon odours were noted during the installation of BP105 and MWD16D.

Field parameters and observations were recorded during groundwater sampling and are presented in Table 1. It should be noted that field parameters were not measured at some monitoring locations due to the presence, or likely presence, of DNAPL.

DNAPL was observed in groundwater purged from recently installed monitoring location MWD16 (shallow and intermediate monitoring well) and newly installed monitoring location BP105 (5 m, 7 m, 11 m, 13 m, 15 m, 17 m, 19 m, 21 m, and 22 m sample ports). DNAPL was also observed in groundwater purged from two pre-existing monitoring locations, namely WG206 (intermediate and deep monitoring well), and BP90 (16 m and 19 m sample ports).

3.2 DNAPL Composition

DNAPL samples collected from the 11 m, 15 m and 22m sample ports of BP105 were analysed in the laboratory for a range of volatile and semi-volatile compounds to assess the composition of the DNAPL. The reported composition of the DNAPL is summarised in the following table. It is possible that compounds other than those in the analytical suite are present in the samples. The analytical results do not account for 100% of the mass of the DNAPL mixture.

Composition of DNAPL at BP105 (% wt(1))

Compound	BP105 - 11 m	BP105 - 15 m	BP105 - 22 m
Tetrachloroethene (PCE)	64.0%	61.0%	61.0%
Carbon Tetrachloride (CTC)	21.0%	18.0%	19.0%
Hexachlorobutadiene (HCBD)	9.3%	7.8%	7.8%
Hexachlorobenzene (HCB)	1.4%	1.1%	1.0%
Hexachloroethane (HCE)	7.4%	6.3%	6.0%
Octachlorostyrene (OCS)	0.16%	NA	NA
Octachloronaphthalene (OCN)	0.01%	NA	NA

(1) As supplied by Leeder Consulting. Please note that the total percentage weight does not equal 100%
NA – not analysed.

The results presented above indicate that DNAPL identified at BP105 was predominantly PCE with components of CTC and Heavy Ends compounds (predominantly HCB, HCBD and HCE). During analysis of the DNAPL samples Leeder Consulting identified two peaks in the chromatograph that corresponded with the compounds octachlorostyrene (OCS) and octachloronaphthalene (OCN). OCS has been identified in DNAPL samples analysed as part of the August 2005 DNAPL source area investigation (URS, 2005). OCN has not been identified in DNAPL samples analysed in earlier DNAPL source area investigation programs. However, Orica documentation indicates that it was known to be a minor component of the 'Heavy Ends' waste generated at the former Solvents Plant. OCN has a very low aqueous solubility limit (ie. the International Program on Chemical Safety indicates that the compound is insoluble). The percentage of OCS and OCN was

assessed in one of the DNAPL samples collected from BP105. As shown in the above table, OCS and OCN accounted for a very small portion of the mass of the DNAPL.

The compounds identified in the DNAPL mixtures are indicative of contaminants from the former Solvents Plant. The composition of DNAPL collected from the 11 m, 15 m and 22 m sample ports of BP105 were similar, indicating DNAPL from a similar source was present throughout the alluvial aquifer at BP105. The results may indicate that DNAPL may have been mobilised through the aquifer during the installation of BP105.

An unknown 'grease-like' substance was observed in the drilling cuttings from MWD16. The substance was observed as small grey balls (approximately 5 mm in diameter) floating inside the drilling mud tank. Similar observations had been made during the installation of several other monitoring wells in the vicinity of the former Solvents Plant, namely BP90, WG206 and WG207. Although the substance was not considered a DNAPL, a sample of the substance was collected from the drilling fluids and analysed in the laboratory for volatile and semi-volatile compounds. The reported results indicate that the substance was 0.2 % HCB and 0.25 % HCBD. HCE and OCS were also detected in the sample but accounted for a very small proportion of the mass (ie. less than 0.05%). The chromatograph from the analysis indicated that the substance was comprised predominantly of hydrocarbons typically found in grease. Based on these results it appears that the substance is a grease. The substance had a different texture to grease used by the drillers, which indicates it came from a source other than the drilling equipment. A possible source of the grease-like material is not known.

In addition to the grease-like substance identified during the installation of MWD16, DNAPL was identified in water purged from MWD16S and MWD16I during the December 2005 quarterly groundwater monitoring event. DNAPL samples were not collected from MWD16S and MWD16I due to an oversight. The composition of dissolved phase contamination in groundwater sampled from MWD16 indicates that the DNAPL was primarily associated with the former Solvents Plant. Compounds indicative of contaminations from the former TCE Plant (including trichloroethene (TCE), 1,1,2-trichloroethane (1,1,2-TCA), 1,1,2,2-tetrachloroethane (1,1,2,2-TeCA) and pentachloroethane) were also reported in MWD16.

3.3 Groundwater Analytical Results

Similarly to the August 2005 progress report, URS has assessed the analytical data in terms of individual CHC concentrations and the 'total percentage solubility'. The calculation of 'total percentage solubility' is based on an adaptation of Raoult's Law, which shows the effective solubility of components of a DNAPL mixture is proportional to their mole fraction within the mixture and their pure phase solubility limits. This is explained in further detail in the August 2005 progress report (URS, 2005).

There are limitations of assessing the dissolved phase CHC data using 'total percentage solubility' within the Southern Plumes' source areas. They include:

- Raoult's Law only applies for estimating dissolved phase contaminant concentrations for a single DNAPL mixture. Where multiple DNAPL sources with different

DNAPL compositions exist it may be possible that the total percentage solubility exceeds 100% without DNAPL being present adjacent that that location. There are likely to be several DNAPL sources within each of the defined Southern Plumes' source areas. The composition of DNAPL within each of the source areas is likely to be highly variable. DNAPL sources may overlap, be mixed together or have remained completely separated from each other;

- The calculation of total percentage solubility includes compounds that may be degradation products of CHCs within DNAPL mixtures;
- Raoult's Law also assumes ideal component behaviour and this is not likely to be the case in the aquifer at the site; and,
- Calculation of total percentage solubility is based on literature values of pure phase solubility for individual CHCs. Literature values for pure phase solubility are typically measured in controlled conditions within a laboratory and may not adequately represent actual pure phase solubilities in groundwater at the site. Also, they do not account for co-solvency effects on some compounds (eg. HCB, which is relatively insoluble solid on its own but can become more soluble once part of a DNAPL mixture).

Groundwater analytical results for volatile and semi-volatile CHCs are presented in Tables 2 and 3. Analytical results are reported as a percentage of their respective pure phase aqueous solubilities in Table 4. The analytical results obtained are discussed below with respect to each monitoring location. New and existing monitoring locations relevant to this investigation are presented in Figure 1.

WG204

The analytical results for WG204 were similar to those reported in the August 2005 DNAPL Progress report (URS, 2005). The calculated total percentage solubility's for WG204S, WG204I and WG204D were 0.1%, 1.5% and 3.8% respectively, and was mostly associated with the concentrations of HCBD reported in the samples. The concentrations of CTC, PCE, and TCE reported in these samples represented less than 0.1% of their respective pure phase solubility limits.

WG205

The reported concentrations of volatile and semi-volatile CHCs in WG205D were in the same order of magnitude as those reported for WG205D in the August 2005 progress report (URS, 2005). The calculated total percentage solubility for WG205D was 4.8%. This was primarily associated with the detection of PCE at a concentration of 7 mg/L in the well. Compounds indicative of PCE and TCE degradation (cis-1,2-dichloroethene, trans-1,2-dichloroethene and 1,1-dichloroethene) were also detected in the sample.

WG205S and WG205I were not sampled as part of this investigation as DNAPL was identified in these wells during the August 2005 investigation (URS, 2005).

WG206

Reported concentrations of volatile and semi-volatile CHCs in WG206S were less than or close to the laboratory detection limits, which is consistent with the analytical results reported in the August 2005 progress report (URS, 2005).

Small beads of DNAPL were observed in groundwater purged from WG206I and WG206D. There was insufficient volume of DNAPL recovered to collect a sample for analysis.

As expected the calculated total percentage solubility for WG206I and WG206D were well in excess of 100%. This was primarily associated with concentrations of HCB and HCBD in excess of their recognised pure phase solubility limits. Reported total volatile CHC concentrations in WG206I and WG206D were 22 mg/L and 2 mg/L, respectively. Volatile CHCs detected included CTC, PCE, TCE, 1,1,2,2-TeCA, pentachloroethane and degradation products of these compounds.

The analytical results for WG206I and WG206D indicate that the DNAPL observed at WG206I and WG206D was likely to be predominantly comprised of Heavy Ends compounds with minor components of products from the former Solvents Plant and former TCE Plant.

WG207

Reported concentrations of volatile and semi-volatile CHCs in WG207S, WG207I and WG207D were consistent with those reported in the August 2005 progress report (URS, 2005). PCE, TCE and their daughter compounds were identified in the samples but the calculated total percentage solubilities were less than 0.6% and total volatile CHC concentrations were less than 2 mg/L. Semi-volatile compounds were not detected in WG207S, WG207I and WG207D, with the exception of the presence of 0.003 mg/L of HCBD in WG207I.

It should be noted that a very strong sweet odour was noted for groundwater sampled from WG207I and WG207D. It may be possible that compounds not in the analytical suite are present at this location.

WG208

Reported concentrations of volatile and semi-volatile CHCs in WG208S, WG208I and WG208D were consistent with those reported in the August 2005 progress report (URS, 2005). PCE, TCE and their daughter compounds were identified in the samples but the calculated total percentage solubilities were less than 1.0% and total volatile CHC concentrations were less than 3 mg/L.

Semi-volatile compounds were not detected in WG208S, WG208I and WG208D.

WG209

Reported concentrations of volatile and semi-volatile CHCs in WG209S, WG209I and WG209D were reasonably consistent with those reported in the August 2005 progress report (URS, 2005), with the exception of the TCE concentration reported in WG209S. The concentration of TCE reported in WG209S was 1.2 mg/L compared to 11.6 mg/L in the August 2005 progress report.

PCE, TCE and their daughter compounds were the most prevalent compounds in WG209S, WG209I and WG209D. CTC was also detected in all three wells. This may be indicative of contamination from the former CTC Tanker loading bay on 5th Avenue, or the first CTC Plant (formerly located on the south east corner of 5th Avenue and 2nd Street).

HCBD was the only semi-volatile detected, and only in WG209S. The calculated total percentage solubilities for WG209S, WG209I and WG209D were less than 0.8% and total CHC concentrations were less than 3 mg/L.

WG210

The total CHC concentrations reported in WG210S, WG210I and WG210D were less than 0.2 mg/L and the calculated total percentage solubilities were 0.0% in each well. Compounds including TCE, PCE, 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethane (EDC), cis-1,2-dichloroethene (cis-1,2-DCE) and trans-1,2-dichloroethene (trans-1,2-DCE) were detected at concentrations close to their detection limits. Semi-volatile compounds were not detected in WG210.

The presence of the volatile CHCs listed above may be indicative of contamination from the former Solvents Plant or former Vinyls Plant. However, the absence of CTC and Heavy Ends compounds indicates that the former Vinyls Plant is the more likely source of the observed dissolved phase contamination at WG210.

It should be noted that dewatering was required for repair works undertaken on the site stormwater system in the vicinity of 1st Street and 8th Avenue in 2000. It is believed that the area now occupied by the Groundwater Treatment Plant (GTP) was temporarily used as a groundwater injection point for the water removed during the works. As such it is possible that dissolved phase contamination associated with DNAPL sources from the former Solvents Plant and former TCE Plant could be present in the vicinity of WG210 without a DNAPL source being present upgradient of that location.

The concentrations of CHCs reported in WG210 indicate that it is not likely to be located within the Southern Plumes DNAPL source area. Based on the results from WG210 it could be assumed that the eastern boundary of the S2 source area lies somewhere between WG210 and WG205.

It should be noted that a strong sour odour was evident from groundwater sampled from WG210I. Similarly to WG207 it may be possible that compounds not in the analytical suite are present at this location.

WG212

The total CHC concentrations reported in WG212S, WG212I and WG212D were less than 1.0 mg/L and the calculated total percentage solubilities were less than 0.1% in each well. Similarly to WG209 (which is located upgradient of WG212) compounds including CTC, TCE, PCE and their daughter compounds were detected in WG212 at concentrations close to their detection limits. The presence of these compounds may be indicative of contamination from the former Solvents Plant, former TCE Plant and/or the first generation CTC Plant. Semi-volatile compounds were not detected in WG212.

The concentrations of CHCs reported in WG212 indicate that it is located outside or close to the southern boundary of the S1 DNAPL source area.

WG213

Reported concentrations of volatile CHCs in WG213S were less than or close to the laboratory detection limits, and the calculated total percentage solubility was 0.0%.

Semi-volatile CHCs were not detected in groundwater sampled from WG213S, WG213I and WG213D, with the exception of 0.003 mg/L of 1,4-dichlorobenzene in WG213I.

Total volatile CHCs reported in WG213I and WG213D were 1247 mg/L and 228 mg/L respectively, and the respective calculated total percentage solubilities were 17.9% and 3.1%. EDC accounted for most of the CHC mass reported in the samples from WG213I and WG213D. WG213 is located in the inferred flow path of the Central Plume, which is predominantly comprised of dissolved phase EDC (typically exceeding 1000mg/L). The Central Plume also typically contains relatively low concentrations of TCE, PCE, VC (typically less than 30 mg/L) as well as traces (less than 1 mg/L) of other compounds found in EDC products and EDC wastes generated at the former Vinyls Plant, and degradation products. Based on the composition of dissolved phase contamination in WG213, it is inferred that the contamination identified in WG213 is related to the Central Plume. The absence of 'Heavy Ends' compounds (from the former Solvents Plant) in WG213 also supports this inference.

It should be noted that groundwater samples collected from nearby MWD16S, MWD16I and MWD16D reported CTC concentrations in excess of 200 mg/L and PCE concentrations in excess of 100 mg/L. The results from WG213 indicate that it is likely to be located to the north of the dissolved phase plume emanating from DNAPL located at MWD16 (and the S2 source area).

MWD16

DNAPL was identified in MWD16S, MWD16I and MWD16D. These wells were sampled as part of the December 2005 quarterly sampling program (URS, 2006) and samples were only analysed for volatile CHCs. The calculated total percentage solubilities for MWD16S and MWD16I were in excess of 100%. The calculated total percentage solubility for MWD16D was 80.1%. DNAPL samples were not collected from MWD16 for analysis. However, dissolved phase concentrations of CTC and PCE

were the highest relative to their respective solubilities indicating that the DNAPL identified in these wells was comprised predominantly of PCE and CTC. Elevated concentrations of HCBD with respect to its solubility limit were also reported in MWD16S and MWD16I indicating that Heavy Ends are also a component of the DNAPL mixture. HCBD was detected in the volatile CHC scan. The full semi-volatiles scan was not part of the December 2005 quarterly sampling program (URS, 2006) so the concentration of other Heavy Ends compounds is not known. These results indicate that the primary source of the DNAPL at MWD16 is the former Solvents Plant. However, the presence of pentachloroethane, and elevated concentrations of 1,1,2,2-TeCA, 1,1,2-TCA and TCE are indicative of DNAPL produced at the former TCE Plant, and could point to a source associated with effluent leakage and/or spillage.

Based on the dissolved phase CHC concentrations reported in the laboratory analysis the DNAPL at MWD16 is likely to have come from both the former Solvents Plant and former TCE Plant. MWD16 is located approximately 100 metres from the former Solvents Plant. WG204 is located between the former Solvents Plant and MWD16 and is relatively free of CHCs in comparison. This indicates that the DNAPL located at MWD16 may possibly be associated with a leaking conduit (effluent pipeline), overland flow and/or complex subsurface flow.

BP90

DNAPL was observed in groundwater purged from the 16 m and 19 m sample ports of BP90 in this sampling event, consistent with the sampling the August 2005 event which reported DNAPL at 16 m, 18 m and 19 m ports. The volume of DNAPL observed from these ports was less than 1 mL in this sampling event.

The concentrations of volatile and semi-volatile CHCs reported for this sampling round were significantly less than those reported in the August 2005 progress report (URS, 2005). For most sample ports the concentrations of CTC, PCE and TCE were less than half of the concentrations reported in the August 2005 progress report. In particular the concentration of TCE in the 19 m sample port was 371 mg/L compared to 1010 mg/L during the previous sampling round.

Reported concentrations of HCBD and HCB were also significantly less than those reported in the August 2005 progress report. In particular HCB was only detected in the 4 m and 19 m sample ports during this sampling round. HCB was detected in the 4 m, 8 m, 10 m, 16 m and 19 m sample ports during the previous sampling event (reported in August 2005 progress report (URS, 2005)).

Calculated total percentage solubilities for BP90 ranged from in excess of 100% in the 4 m and 19 m sample ports down to 10% in the 12 m sample port. Interestingly the calculated total percentage solubility in the 16 m sample port was only 40%, even though DNAPL was recovered from that sample port. This result may indicate that compounds other than those in the analytical suite are present in water sampled from BP90. The result illustrates the limitations of inferring the presence of DNAPL based on comparison of dissolved phase concentrations to pure phase solubility limits. Whilst it is a good tool for assessing data, the total percentage solubility will not always be greater than 100%

when DNAPL is present at the sampling location. Similarly, DNAPL may be present where the total percentage solubility is less than 100% (and in this case as low as 40%).

The decreases in CHC concentrations may indicate that groundwater sampled in June 2005 was impacted from the installation (drilling) works. Analysis of the results and observations presented in the August 2005 progress report (URS, 2005) indicated that DNAPL may have been encountered, and potentially mobilised, during the installation of BP90.

Concentrations of EDC at all ports of BP90 are very low compared to most locations on site, and with relatively high concentrations of 1,1,2,2-TeCA, EDC may here be present just as a daughter degradation product of 1,1,2,2-TeCA and 1,1,2-TCA.

BP103

BP103 was installed to assess the northern boundary of the S1 source area. BP103 lies within the Central Plume and elevated CHC concentrations (in particular EDC) were expected at this location. The presence of compounds generally associated with the Southern Plumes source areas can be used to distinguish between dissolved phase contamination in the Central and Southern Plumes.

CTC was not detected in any sample port of BP103. CTC is typically detected within the S1 source area and associated dissolved phase plume.

HCBD was detected in the 5 m, 7 m, 9 m, 11 m and 13 m sample ports of BP103. HCBD is not typically encountered within the Central Plume so its detection at BP103 suggests that a Southern Plumes DNAPL source is located somewhere upgradient of BP103, possibly in the vicinity of MWD16 where DNAPL containing HCBD has been observed. The aim of installing BP103 was to identify a 'clean edge' that would allow the S1 source area boundary to be better defined. It should be noted that MWD16 had not been installed and sampled at the time BP103 was installed and URS was not aware that DNAPL was present in the area immediately surrounding MWD16. The possible presence of DNAPL upgradient of the inferred S1 source area makes assessing the northern boundary of the S1 source area difficult.

PCE and TCE were detected in most sample ports of BP103. It is not possible to distinguish whether the TCE and PCE present is associated with the Southern or Central Plumes.

The presence of 27 mg/L of 1,1,2,2-TeCA in the 21 m sample port may indicate that some of the dissolved phase contamination at BP103 is related to the S1 or other Southern Plumes source areas. Whilst 1,1,2,2-TeCA is a Central Plume contaminant as well (e.g., past detections in soil at TP-EDC8) and exists in low concentrations in samples collected from some Central Plume monitoring locations, it is not a significant Central Plume contaminant.

The calculated total percentage solubility for BP103 ranged between 0.0% and 50%. Excluding EDC concentrations, which were up to 3500 mg/L, the total percentage solubility was 9.1% in the 21 m sample port and less than 3% in all other sample ports.

BP104

BP104 was installed to assess the northern boundary of the S1 source area. Similarly to BP103, BP104 lies within the Central Plume and elevated CHC concentrations (in particular EDC) were expected at this location. The presence of compounds generally consistent with the Southern Plumes source areas can be used to distinguish between dissolved phase contamination in the Central and Southern Plumes.

Reported concentrations of CTC ranged between 30 and 155 mg/L in the 6 m, 8 m, 10 m, 12 m and 14 m ports of BP104. PCE concentrations in the same sample ports ranged from 36 to 80 mg/L. Concentrations of HCBD were also elevated relative to its pure phase solubility limit in sample ports between 6 and 20 m below ground level. The calculated total percentage solubility in the 6 m, 8 m, 10 m, 12 m and 14 m ports of BP104 ranged between 32% and 80%. These results indicate that DNAPL from the former Solvents Plant is located at or upgradient of BP104. The presence of elevated dissolved phase concentrations of CTC and PCE at BP104 may be associated with DNAPL located at MWD16, in the vicinity of the former Solvents Plant or in close proximity to BP104.

Concentrations of TCE were typically less than 10 mg/L but were up to 64 mg/L in the 20 m and 22 m sample ports of BP104. The concentrations of 1,1,2,2-TeCA were typically less than 1 mg/L but were up to 73 mg/L in the 20 m and 22 m sample ports of BP104. The concentrations of CTC and PCE were much lower in these two sample ports than in other sample ports of BP104. Elevated TCE and 1,1,2,2-TeCA concentrations were also present in the 21 m sample port of BP103. These results indicate that DNAPL from the former TCE Plant may be present at depths greater than 20 m bgl upgradient of both BP103 and BP104.

It should be noted that elevated EDC concentrations (up to 947 mg/L) were reported in samples collected from the upper 24 metres of BP104. This contamination is considered to be indicative of the Central Plume. As such, it should be assumed that some of the TCE and PCE detected in BP104 is related to the Central Plume.

The dissolved phase data for BP104 shows two apparent zones of contamination that may indicate the presence of DNAPL at or upgradient of BP104. The first appears to be between 5 and 10 m bgl and is characterised by elevated CTC, PCE and HCBD concentrations and is indicative of contamination from the former Solvents Plant. The second is between 18 and 24 m bgl and is characterised by elevated TCE and 1,1,2,2-TeCA concentrations and is indicative of contamination from the former TCE Plant. These results appear to be consistent with soil core sampling results from CH18 and CH19 (see Figure 1) which indicated DNAPL was likely to be present above two low permeability layers, one approximately 5 m bgl and the other at approximately 20 m bgl. The dissolved phase contamination profile for BP104 indicates that the zones of contamination are in the order of 5 m thick but this is unlikely. The distribution of

contamination may have been affected by the installation of BP104, most likely from smearing of contaminants through the borehole in the drilling mud.

The possible presence of controlling low permeability layers also appears to affect the distribution of dissolved phase EDC from the Central Plume, which is detected in BP104.

BP105

DNAPL was observed in the 5 m, 7 m, 11 m, 13 m, 15 m, 17 m, 19 m, 21 m and 22 m sample ports of BP105. In excess of 10 mL of DNAPL was recovered from most sample ports. Where possible samples of the DNAPL were collected for analysis along with groundwater samples that were analysed to characterise the dissolved phase contamination. DNAPL samples from the 11 m, 15 m and 22 m sample ports were analysed in the laboratory to determine their composition and the results were presented above. The results indicated that each of the DNAPL samples collected had a similar composition. These results indicate that DNAPL may have been mobilised during the installation of BP105.

Groundwater samples were also collected from most sample ports of BP105 to assess the dissolved phase concentrations of CHCs. Small volumes of DNAPL may have been present in water samples collected.

The calculated total percentage solubility for sample ports where DNAPL was identified were in excess of 100% as expected. It should be noted that the total percentage solubility of the volatile CHCs was typically less than 100% (except at the 21 m sampling port) and was as low as 32%. This is an interesting observation considering the results of DNAPL analysis, which indicated that the DNAPL was predominantly PCE and CTC. Concentrations of HCB and HCBD were many orders of magnitude greater than their pure phase solubility limits in most sample ports. It should be noted that the solubility of HCB increases by orders of magnitude when the HCB is in a DNAPL mixture containing solvents. HCB was only detected in sample ports where DNAPL was observed.

Pentachloroethane was also detected in most sample ports of BP105. It is believed that pentachloroethane quickly breaks down into its daughter compounds when in the dissolved phase as it is rarely detected in groundwater samples collected at Botany. Therefore, if pentachloroethane is present it is a good indication that DNAPL is located at or close to the sampling location. In the case of BP105, DNAPL was identified in most sample ports.

BP106

BP106 was installed to further assess the S3 source area. Compounds associated with the former TCE Plant (including pentachloroethane, TCE, PCE and 1,1,2,2-TeCA) and their daughter products were reported in groundwater samples collected from BP106.

Reported concentrations of TCE were up to 28 mg/L, with maximum concentrations reported in the 10 and 12 m sample ports. Reported concentrations of PCE were up to 12 mg/L, with maximum concentrations reported in the 8 and 10 m sample ports.

Reported concentrations of 1,1,2,2-TeCA were up to 10 mg/L, with maximum concentrations reported in the 10 and 12 m sample ports. HCBD was detected in all samples collected below 6 m sample. Pentachloroethane was detected in the 10, 14, 16 and 18 m sample ports of BP106. Pentachloroethane is rarely detected in dissolved phase plumes at the site. It is thought that pentachloroethane readily degrades into its daughter product 1,1,2,2-TeCA once in the dissolved phase. The presence of pentachloroethane may indicate that DNAPL containing pentachloroethane is located in relatively close proximity to BP106.

Similarly to the results from BP96 (located approximately 50 metres to the east) reported in August 2005 (URS, 2005), the concentrations of most CHCs in BP106 were less than those in the upgradient bundle piezometer BP90, although the compositions were similar.

The calculated total percentage solubilities ranged from 0.9% to 14%. The calculated total percentage solubility exceeded 10% in the 8 and 10 m sample ports (mainly due to PCE and HCBD). Whilst the calculated total percentages were relatively low, it should be noted that the total percentage solubility in the 16 m sample port of BP90 (located upgradient) was only 40%, even though DNAPL was identified in groundwater purged from that sample port.

3.3.1 Quality Assurance and Quality Control

A qualitative assessment of all data reported in this report was undertaken by URS. Data validation summary reports are presented as Appendix B. The precision and accuracy of the data obtained was considered suitable enough for the data to be relied upon to make conclusions with respect to the main objective of this delineation investigation, which was to better characterise the Southern Plumes DNAPL source areas.

4. Discussion of Results

DNAPL was identified at two new locations during this investigation, MWD16 and BP105. DNAPL was also positively identified at WG206 and BP90 confirming conclusions made in the August 2005 progress report (URS, 2005). A plan showing locations where DNAPL has been identified in the field, or inferred to be present based on CHC concentrations in soils, is presented in Figure 2. Figure 3 shows the inferred extent of the Southern Plumes DNAPL source areas and also shows an area in which DNAPL may exist based on dissolved phase concentrations of CHCs in groundwater. Figures 2 and 3 are based on all data available at the time this letter report was prepared.

It was not known that DNAPL existed in the vicinity of MWD16 prior to this investigation. The presence of DNAPL at MWD16 makes interpretation of the data from BP103 and BP104 difficult as it is not possible to distinguish between dissolved phase contamination that may be emanating from the DNAPL source area identified at MWD16 (potentially a new S4 plume) and dissolved phase contamination that may be associated with the S1 source area. This makes it difficult to assess whether DNAPL exists in the area between MWD16 and the northern boundary of Southlands-Block 1. DNAPL identified at MWD16 may be connected to a greater S2 source area, or may be associated

with a previously unknown source, possibly leakage, spillage and/or sub-surface flow of effluent from the former Solvents Plant and/or former TCE Plant.

The DNAPL identified at BP105 appears to be primarily associated with the former Solvents Plant. It is not possible to determine how DNAPL migrated to this location from the former Solvents Plant. It may have migrated above and/or below ground.

The results from wells WG204 to WG209 were consistent with those reported in the August 2005 progress report (URS, 2005).

The concentrations of CHCs reported in WG210 indicate that it is not likely to be located within the Southern Plumes DNAPL source area. Based on the results from WG210 it could be assumed that the eastern boundary of the S2 source area lies somewhere between WG210 and WG205.

The concentrations of CHCs reported in WG212 indicate that it is located outside or close to the southern boundary of the S1 DNAPL source area.

The results from WG213 indicate that it is likely to be located to north of the dissolved phase plume emanating from DNAPL located at MWD16 (and the S2 source area).

Data gaps still remain to the east of the S2 and S3 source areas and to the south of the S3 source area due to the inability to install two monitoring locations (WG211 and BP107) as part of this investigation program.

The data obtained from the newly installed bundle piezometers on Southlands – Block 1 has improved our understanding of the distribution of DNAPL in the subsurface and dissolved phase contamination in the Southern Plumes. The identification of DNAPL at BP105 confirmed inferences made in the August 2005 progress report (URS, 2005) that DNAPL was likely to be located to the north of BP23.

5. Conclusions

Locations where DNAPL has been identified in the field, or inferred to be present based on the results presented above, and those of previous investigations, are presented in Figure 2. The inferred and possible extents of the Southern Plumes DNAPL source areas are presented in Figure 3. The results of this investigation have provided additional insight into the possible locations of the Southern Plumes DNAPL source areas, however uncertainties remain as to the exact extent of the source areas.

The discovery of DNAPL at MWD16, previously though to have been located outside the Southern Plumes source areas has further complicated the assessment of the source area boundaries.

Data gaps still remain to the east of the S2 and S3 source areas and to the south of the S3 source areas due to the inability to install two monitoring locations (WG211 and BP107) as part of this investigation program.

The data obtained from the newly installed bundle piezometers on Southlands – Block 1 has improved our understanding of the distribution of DNAPL in the subsurface and dissolved phase contamination in the Southern Plumes. The identification of DNAPL at BP105 confirmed inferences made in the August 2005 progress report (URS, 2005), that DNAPL was likely to be located to the north of BP23.

Monitoring wells and bundle piezometers installed during this phase were installed using mud rotary drilling techniques. Consequently, accurate lithological data could not be obtained during the investigation.

6. Recommendations

The value of further groundwater assessment in and around the Southern Plumes source areas is not clear at present due to the imminent start of full scale hydraulic containment at the BIP and at Southlands. Full scale pumping is likely to significantly influence groundwater flow patterns in and around the source areas, making interpretation of groundwater data more difficult. In addition, it has proved difficult to undertake further assessment of the area east / north east of the Southern Plumes source areas due to the presence of the operating Surfactants Plant. Similarly, limitations on access to the Botany Rail corridor are a barrier to full delineation of the Southern Plumes source areas. URS does not recommend any further delineation investigations of the Southern Plumes source areas in the near future. Further investigations should be targeted at data collection to support trials of DNAPL removal technologies.

URS recommends that proposed primary recovery trials be undertaken to assess the potential for this method to be applicable at the site.

7. References

URS (2005). Orica Botany Environmental Survey Stage 4 – Remediation *Progress Report – Southern Plumes DNAPL Source Area Delineation Investigation, August 2005,* Document Number R031A, 23 December 2005.

URS (2006). Orica Botany Environmental Survey Stage 4 – Remediation *Groundwater Treatment Plant (GTP) Quarterly Groundwater and Surface Water Monitoring Report December 2005,* Document Number 43217457.00004/R005, 28 February 2006.

Yours sincerely,
URS AUSTRALIA PTY LTD

James Morrow
Environmental Engineer

Michael Hayter
Senior Principal Hydrogeologist

cc: James Fairweather
James Stening

Attachments:

Tables

Table 1 – Groundwater Field Parameters
Table 2 – Volatile CHC Concentrations in Groundwater (mg/L)
Table 3 – Semi-Volatile CHC Concentrations in Groundwater (mg/L)
Table 4 – Total Percentage Solubility of CHCs (%)

Figures

Figure 1 – DNAPL Source Area Investigation Locations – Southern Plumes
Figure 2 – Southern Plumes DNAPL Source Areas – DNAPL Locations
Figure 3 – Inferred Extent of Southern Plumes DNAPL Source Areas

Appendix A – Soil Lithology and Bundle Piezometer Construction Logs

Appendix B – Data Validation Forms

Tables

Table 1
Groundwater Field Parameters
Southern Plumes DNAPL Source Area Investigation - February 2006

Location	Depth	Date Sampled	Volume (L) Removed	pH	EC (µS/cm)	TDS (calc)	Er* (mV)	Eh (mV)	Temp (°C)	DO ppm	Comments
BP90	**2**	7-Feb-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								DRY - ABOVE WATER TABLE
BP90	**4**	7-Feb-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								DARK BROWN - COKE LIKE
BP90	**6**	7-Feb-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								SILTED BROWN
BP90	**8**	7-Feb-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								SILTED BROWN
BP90	**10**	7-Feb-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								SLIGHT HC SHEEN, SILTED BROWN
BP90	**12**	7-Feb-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								HC SHEEN, SILTED BROWN
BP90	**14**	7-Feb-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								CLEAR COLOURLESS
BP90	**16**	7-Feb-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								DNAPL PRESENT AS SMALL PARTICLES. SOME COAGULATION OF DNAPL ON BOTTOM OF BUCKET (<1ML TOTAL)
BP90	**18**	7-Feb-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								CLEAR COLOURLESS
BP90	**19**	7-Feb-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								DNAPL PRESENT AS SMALL PARTICLES. SOME COAGULATION OF DNAPL ON BOTTOM OF BUCKET (<1ML TOTAL)
BP103	**1**	8-Nov-05	DRY								1M PORT ABOVE WATER LEVEL - DRY
BP103	**3**	8-Nov-05	2	6.75	990	594	-45	185	27.8	1.01	CLEAR, STRONG EDC ODOUR
BP103	**5**	8-Nov-05	2	5.38	1679	1007	98	328	26.5	1.26	CLEAR, STRONG EDC ODOUR
BP103	**7**	8-Nov-05	2	5.48	1150	690	171	401	25.5	0.89	CLEAR, STRONG EDC ODOUR
BP103	**9**	8-Nov-05	2	5.58	1675	1005	52	282	27.3	1.55	CLEAR, STRONG EDC ODOUR
BP103	**11**	8-Nov-05	3	4.81	2530	1518	38	268	23.3	1.98	CLEAR, STRONG EDC ODOUR
BP103	**13**	8-Nov-05	3	5.26	1029	617	0	230	23.2	1.49	CLEAR, STRONG EDC ODOUR
BP103	**15**	8-Nov-05	3	5.52	769	461	2	232	23.1	1.91	CLEAR, STRONG EDC ODOUR
BP103	**17**	8-Nov-05	3	5.42	693	416	5	235	23.0	1.67	CLEAR, STRONG EDC ODOUR
BP103	**19**	8-Nov-05	3	5.83	729	437	14	244	22.1	2.44	CLEAR, STRONG EDC ODOUR
BP103	**21**	8-Nov-05	2	4.55	3840	2304	55	285	22.3	2.97	CLEAR, STRONG EDC ODOUR
BP103	**23**	8-Nov-05	2	6.23	2151	1291	8	238	23.6	3.28	CLEAR, STRONG EDC ODOUR
BP103	**25**	8-Nov-05	2	5.56	1638	983	17	247	23.3	2.26	CLEAR, STRONG EDC ODOUR
BP103	**27**	8-Nov-05	BLOCKED								BLOCKED
BP104	**2**	8-Nov-05	4	6.20	1006	604	25	255	22.6	1.12	LIGHT BROWN
BP104	**4**	8-Nov-05	4	5.43	2870	1722	52	282	22.5	1.20	CLEAR
BP104	**6**	8-Nov-05	4	4.87	2085	1251	90	320	22.5	1.24	CLEAR
BP104	**8**	8-Nov-05	3	5.16	2143	1286	92	322	22.2	1.41	CLEAR
BP104	**10**	8-Nov-05	3	5.19	2690	1614	76	306	22.1	1.97	YELLOW
BP104	**12**	8-Nov-05	3	5.71	3120	1872	-8	222	21.7	3.00	CLEAR
BP104	**14**	8-Nov-05	2	5.91	1746	1048	-16	214	22.0	3.75	CLEAR
BP104	**16**	8-Nov-05	3	5.13	571	343	28	258	22.1	2.64	LIGHT GREY TURBID
BP104	**18**	8-Nov-05	3	4.78	572	343	37	267	21.9	2.16	CLEAR
BP104	**20**	8-Nov-05	3	5.00	3850	2310	42	272	21.6	2.74	CLEAR
BP104	**22**	8-Nov-05	3	5.28	3270	1962	22	252	22.1	1.74	CLEAR (DUP04)

Table 1
Groundwater Field Parameters
Southern Plumes DNAPL Source Area Investigation - February 2006

Location	Depth	Date Sampled	Volume (L) Removed	pH	EC (µS/cm)	TDS (calc)	Er* (mV)	Eh (mV)	Temp (°C)	DO ppm	Comments
BP104	**24**	8-Nov-05	3	5.69	2880	1728	-1	229	22.0	2.03	LIGHT BROWN (DUP05)
BP104	**25.5**	8-Nov-05	BLOCKED								BLOCKED
BP105	**1**	9-Nov-05	DRY								
BP105	**3**	9-Nov-05	NO FIELD DATA DUE TO PRESENCE OF DNAPL								DNAPL NOT OBSERVED IN THIS PORT
BP105	**5**	9-Nov-05	NO FIELD DATA DUE TO PRESENCE OF DNAPL								DNAPL SAMPLE COLLECTED
BP105	**7**	9-Nov-05	NO FIELD DATA DUE TO PRESENCE OF DNAPL								DNAPL SAMPLE COLLECTED
BP105	**9**	9-Nov-05	NO FIELD DATA DUE TO PRESENCE OF DNAPL								DNAPL NOT OBSERVED IN THIS PORT
BP105	**11**	9-Nov-05	NO FIELD DATA DUE TO PRESENCE OF DNAPL								DNAPL SAMPLE COLLECTED
BP105	**13**	9-Nov-05	NO FIELD DATA DUE TO PRESENCE OF DNAPL								DNAPL SAMPLE COLLECTED
BP105	**15**	9-Nov-05	NO FIELD DATA DUE TO PRESENCE OF DNAPL								DNAPL SAMPLE COLLECTED
BP105	**17**	9-Nov-05	NO FIELD DATA DUE TO PRESENCE OF DNAPL								DNAPL SAMPLE COLLECTED
BP105	**19**	9-Nov-05	NO FIELD DATA DUE TO PRESENCE OF DNAPL								DNAPL SAMPLE COLLECTED
BP105	**21**	9-Nov-05	NO FIELD DATA DUE TO PRESENCE OF DNAPL								DNAPL SAMPLE COLLECTED
BP105	**22**	9-Nov-05	NO FIELD DATA DUE TO PRESENCE OF DNAPL								INSUFFICIENT WATER FROM 22M TO GET SAMPLE
BP106	**2**	9-Nov-05	4	6.37	1165	699	60	290	22.8	2.86	FRUIT LIKE ODOUR
BP106	**4**	9-Nov-05	3	6.29	3116	1870	26	256	22.6	3.02	FRUIT LIKE ODOUR
BP106	**6**	9-Nov-05	3	6.00	3130	1878	-5	225	23.0	-	FRUIT LIKE ODOUR
BP106	**8**	9-Nov-05	3	4.20	11500	6900	58	288	23.1	1.82	STRONG FRUIT LIKE ODOUR
BP106	**10**	9-Nov-05	4	4.18	14780	8868	63	293	23.2	2.24	STRONG FRUIT LIKE ODOUR
BP106	**12**	9-Nov-05	4	4.60	3660	2196	25	255	23.2	2.06	STRONG FRUIT LIKE ODOUR
BP106	**14**	9-Nov-05	4	4.55	2960	1776	22	252	23.2	2.25	STRONG FRUIT LIKE ODOUR
BP106	**16**	9-Nov-05	4	4.84	2490	1494	11	241	23.3	1.99	STRONG FRUIT LIKE ODOUR
BP106	**18**	9-Nov-05	3	4.62	3030	1818	-5	225	23.7	3.26	FRUIT LIKE ODOUR
BP106	**20**	9-Nov-05	3	4.57	3770	2262	-3	227	23.4	2.83	FRUIT LIKE ODOUR
BP106	**22**	9-Nov-05	BLOCKED								BLOCKED
BP106	**23**	9-Nov-05	BLOCKED								BLOCKED
WG204S	**-**	7-Feb-06	5	6.46	1103	662	-94	136	22.1	4.96	YELLOW/BROWN, FIBROUS MATERIAL
WG204I	**-**	7-Feb-06	5	6.17	840	482	-81	149	21.2	4.63	BROWN/BLACK, SURFACE SHEEN
WG204D	**-**	7-Feb-06	5	5.72	409	245	-56	174	21.0	2.20	YELLOW CLEAR
WG205D	**-**	7-Feb-06	NO FIELD DATA DUE TO PRESENCE OF DNAPL								CLEAR, COLOURLESS (QC500)
WG206S	**-**	24-Jan-06	20	6.50	1755	1053	-213	17	21.6	0.23	BLACK, ORGANIC ODOUR, NO SHEEN
WG206I	**-**	24-Jan-06	NO FIELD DATA DUE TO PRESENCE OF DNAPL								GREEN/BROWN WITH DARK BROWN DNAPL WITH LIGHT BROWN SOLIDS (LIKE EAR WAX)
WG206D	**-**	24-Jan-06	NO FIELD DATA DUE TO PRESENCE OF DNAPL								BROWN FLOCK, STRONG FRUITY ODOUR
WG207S	**-**	24-Jan-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								BLACK, STRONG HC ODOUR
WG207I	**-**	24-Jan-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								BROWN FLOCK, STRONG FRUITY ODOUR

Table 1
Groundwater Field Parameters
Southern Plumes DNAPL Source Area Investigation - February 2006

Location	Depth	Date Sampled	Volume (L) Removed	pH	EC (µS/cm)	TDS (calc)	Er* (mV)	Eh (mV)	Temp (°C)	DO ppm	Comments
WG207D	-	24-Jan-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF DNAPL								POSSIBLE DNAPL, STRONG FRUITY ODOUR
WG208S	-	24-Jan-06	20	3.70	675	405	208	438	24.4	1.18	ORANGE/BROWN NO SHEEN
WG208I	-	24-Jan-06	25	5.80	803	482	100	330	23.7	0.72	GREY BROWN, SLIGHT HC ODOUR
WG208D	-	24-Jan-06	25	3.80	849	509	99	329	24.2	0.13	GREY BROWN, HC SHEEN ON WATER (QC100)
WG209S	-	7-Feb-06	5	6.12	730	438	-7	223	26.4	2.11	YELLOW, CLEAR
WG209I	-	7-Feb-06	5	6.35	1446	482	-104	126	26.5	0.91	YELLOW, CLEAR
WG209D	-	7-Feb-06	5	4.04	1009	605	44	274	26.9	1.19	CLEAR
WG210S	-	7-Feb-06	25	6.88	794	476	-147	83	21.6	0.98	BLACK TURBID H2S ODOUR
WG210I	-	7-Feb-06	NO FIELD DATA DUE TO POTENTIAL PRESENCE OF NAPL								DARK GREY/BLACK STRONG HC ODOUR (NOT CHCs)
WG210D	-	7-Feb-06	35	6.48	345	207	-62	168	20.6	0.78	BROWN TURBID, NO ODOUR
WG212S	-	7-Feb-06	7	6.06	150	90	-36	194	28.8	2.55	SILTED DARK BROWN
WG212I	-	7-Feb-06	7	6.07	960	482	-66	164	27.8	1.00	CLEAR BUT YELLOW
WG212D	-	7-Feb-06	3	6.04	1008	605	-133	97	28.7	0.86	CLEAR/COLOURLESS
WG213S	-	7-Feb-06	5	6.82	920	552	-124	106	20.3	2.44	COLOURED BROWN
WG213I	-	7-Feb-06	5	4.87	907	482	17	247	19.9	1.67	CLEAR, COLOURLESS
WG213D	-	7-Feb-06	5	5.53	504	302	-33	197	19.7	1.67	CLEAR, COLOURLESS
MWD16S	-	2-Dec-05	15	5.61	1793	1076	-147	83	21.2	0.61	brown, DNAPL beads, HC sheen
MWD16I	-	2-Dec-05	15	5.53	1521	913	-140	90	20.5	0.21	brown/yellow, HC sheen, DNAPL at bottom of bucket, QC209
MWD16D	-	2-Dec-05	15	5.43	425	255	5	235	21.0	0.36	clear, slight HC sheen

Er = oxidation reduction (redox) potential as measured with a platinum electrode and silver/silver chloride reference electrode
Eh = redox potential relative to the standard hydrogen electrode. (Eh = Er + 230mV).
TDS = EC in µS x 0.6

Table 2
Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP104	BP104
Depth	**3**	**5**	**7**	**9**	**11**	**13**	**15**	**17**	**19**	**21**	**23**	**25**	**2**	**4**
Date	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**
Carbon Tetrachloride	<0.001	<0.05	<0.005	<0.2	<0.2	<0.2	<0.05	<0.05	<0.05	<1	<0.005	<0.02	0.022	1.580
Chloroform	0.011	3.380	1.800	5.080	3.820	1.400	0.377	0.160	0.409	1.900	0.096	1.490	0.019	6.950
Methylene chloride	<0.005	<0.25	<0.025	<1	<1	<1	<0.25	<0.25	<0.25	<5	<0.025	<0.1	<0.005	1.000
Chloromethane	<0.01	<0.5	<0.05	<2	<2	<2	<0.5	<0.5	<0.5	<10	<0.05	<0.2	<0.01	<0.2
Total Chlorinate Methanes	**0.011**	**3.380**	**1.800**	**5.080**	**3.820**	**1.400**	**0.377**	**0.160**	**0.409**	**1.900**	**0.096**	**1.490**	**0.041**	**9.530**
Pentachloroethane	<0.001	<0.05	<0.005	<0.2	<0.2	<0.2	<0.05	<0.05	<0.05	<1	<0.005	<0.02	<0.001	<0.02
1.1.1.2-Tetrachloroethane	<0.001	<0.05	<0.005	<0.2	<0.2	<0.2	<0.05	<0.05	<0.05	<1	<0.005	<0.02	<0.001	<0.02
1.1.2.2-Tetrachloroethane	<0.001	0.332	0.035	<0.2	<0.2	0.296	<0.05	<0.05	<0.05	27.500	0.005	0.063	<0.001	0.181
1.1.1-Trichloroethane	<0.001	<0.05	0.005	<0.2	<0.2	<0.2	<0.05	<0.05	<0.05	<1	<0.005	<0.02	<0.001	<0.02
1.1.2-Trichloroethane	<0.001	0.718	0.097	0.464	0.572	0.552	0.135	0.052	<0.05	2.600	0.007	0.123	0.002	2.820
1.1-Dichloroethane	0.002	0.316	0.148	1.750	1.320	<0.2	0.093	0.059	0.158	<1	0.090	0.226	0.021	0.180
1.2-Dichloroethane	0.111	92.300	2.240	626.000	724.000	305.000	182.000	144.000	79.700	3510.000	1.470	39.000	0.037	26.800
Chloroethane	0.010	<0.5	<0.05	<2	<2	<2	<0.5	<0.5	<0.5	<10	<0.05	<0.2	<0.01	<0.2
Total Chlorinated Ethanes	**0.123**	**93.666**	**2.525**	**628.214**	**725.892**	**305.848**	**182.228**	**144.111**	**79.858**	**3540.100**	**1.572**	**39.412**	**0.060**	**29.981**
Tetrachloroethene	<0.001	1.160	0.026	0.432	1.780	2.330	0.302	0.078	<0.05	5.220	0.005	<0.02	0.006	0.222
Trichloroethene	0.023	4.770	1.690	5.690	5.920	3.920	2.290	1.610	1.180	32.800	0.196	0.663	0.049	8.240
1.1-Dichloroethene	0.001	0.326	0.124	0.667	0.764	0.211	0.137	0.096	0.090	<1	0.015	0.076	0.001	0.105
cis-1.2-Dichloroethene	0.006	6.610	0.476	2.980	3.750	0.904	0.700	0.443	0.655	3.110	0.073	0.811	0.055	14.300
trans-1.2-Dichloroethene	0.001	0.093	0.063	0.368	0.310	<0.2	<0.05	<0.05	<0.05	<1	0.012	0.057	0.003	0.273
Vinyl chloride	0.020	8.620	1.360	25.600	24.800	6.080	5.800	4.050	3.520	40.000	0.220	3.060	0.090	6.760
Total Clorinated Ethenes	**0.051**	**21.579**	**3.739**	**35.737**	**37.324**	**13.445**	**9.229**	**6.277**	**5.445**	**81.130**	**0.521**	**4.667**	**0.204**	**29.900**
Total Volatile CHCs	**0.185**	**118.625**	**8.064**	**669.031**	**767.036**	**320.693**	**191.834**	**150.548**	**85.712**	**3623.130**	**2.189**	**45.569**	**0.305**	**69.411**
Carbon disulfide	<0.001	0.176	0.009	<0.2	<0.2	<0.2	<0.05	<0.05	<0.05	<1	<0.005	<0.02	0.002	0.121

Table 2
Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	BP104	BP104	BP104	BP104	BP104	BP104	BP104	BP104	BP104	BP104	BP105	BP105	BP105	BP105
Depth	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**24**	**3**	**5**	**7**	**9**
Date	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**08-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**
Carbon Tetrachloride	155.000	134.000	57.700	53.300	29.700	1.900	3.590	0.747	0.257	2.640	0.029	66.300	120.000	101.000
Chloroform	10.100	5.140	3.920	7.750	2.750	0.754	0.832	5.360	7.360	10.300	0.001	9.820	13.800	10.900
Methylene chloride	<0.25	<1	<1	<1	<0.25	<0.25	<1	<1	<1	1.140	<0.005	<0.25	<0.25	<0.25
Chloromethane	<0.5	<2	<2	<2	<0.5	<0.5	<2	<2	<2	<0.5	<0.01	<0.5	<0.5	<0.5
Total Chlorinate Methanes	**165.100**	**139.140**	**61.620**	**61.050**	**32.450**	**2.654**	**4.422**	**6.107**	**7.617**	**14.080**	**0.030**	**76.120**	**133.800**	**111.900**
Pentachloroethane	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.001	0.155	0.353	0.206
1.1.1.2-Tetrachloroethane	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.001	<0.05	<0.05	<0.05
1.1.2.2-Tetrachloroethane	0.172	<0.2	<0.2	0.524	0.179	<0.05	<0.2	49.500	73.300	0.298	<0.001	0.730	1.010	1.110
1.1.1-Trichloroethane	<0.05	<0.2	<0.2	<0.2	<0.05	<0.05	<0.2	<0.2	<0.2	<0.05	<0.001	0.059	0.110	<0.05
1.1.2-Trichloroethane	0.842	0.338	0.377	0.591	0.274	0.191	0.242	5.020	8.240	3.140	<0.001	2.100	3.740	2.120
1.1-Dichloroethane	0.184	0.376	0.480	0.423	0.172	0.055	<0.2	<0.2	<0.2	0.194	0.002	0.056	0.073	0.086
1.2-Dichloroethane	63.100	451.000	437.000	297.000	158.000	155.000	251.000	947.000	221.000	98.800	0.002	1.290	0.636	2.700
Chloroethane	<0.5	<2	<2	<2	<0.5	<0.5	<2	<2	<2	<0.5	<0.01	<0.5	<0.5	<0.5
Total Chlorinated Ethanes	**64.298**	**451.714**	**437.857**	**298.538**	**158.625**	**155.246**	**251.242**	**1001.520**	**302.540**	**102.432**	**0.004**	**4.390**	**5.922**	**6.222**
Tetrachloroethene	61.700	80.400	76.900	68.000	35.700	11.800	15.900	3.660	1.440	0.198	0.004	33.200	83.400	57.900
Trichloroethene	1.550	4.730	6.270	4.860	3.240	3.900	3.990	44.000	64.200	8.270	0.013	10.600	19.400	5.890
1.1-Dichloroethene	1.090	0.832	0.724	0.621	0.262	0.093	<0.2	0.333	0.413	0.107	<0.001	<0.05	<0.05	0.128
cis-1.2-Dichloroethene	0.300	0.591	0.905	0.807	0.476	0.524	0.468	15.100	24.900	7.310	0.008	1.560	2.150	0.864
trans-1.2-Dichloroethene	0.054	<0.2	<0.2	<0.2	<0.05	<0.05	<0.2	5.210	8.530	0.176	0.005	0.080	0.167	0.073
Vinyl chloride	4.400	15.800	17.900	14.700	5.570	1.520	2.520	7.010	4.010	6.160	<0.01	0.620	0.740	0.760
Total Clorinated Ethenes	**69.094**	**102.353**	**102.699**	**88.988**	**45.248**	**17.837**	**22.878**	**75.313**	**103.493**	**22.221**	**0.030**	**46.060**	**105.857**	**65.615**
Total Volatile CHCs	**298.492**	**693.207**	**602.176**	**448.576**	**236.323**	**175.737**	**278.542**	**1082.940**	**413.650**	**138.733**	**0.064**	**126.570**	**245.579**	**183.737**
Carbon disulfide	5.710	5.620	2.600	3.580	1.340	0.104	<0.2	0.587	0.931	0.420	0.001	1.760	2.150	2.980

Table 2
Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	BP105	BP105	BP105	BP105	BP105	BP105	BP106	BP106	BP106	BP106	BP106	BP106	BP106	BP106
Depth	**11**	**13**	**15**	**17**	**19**	**21**	**2**	**4**	**6**	**8**	**10**	**12**	**14**	**16**
Date	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**	**09-Nov-05**
Carbon Tetrachloride	102.000	129.000	149.000	75.200	81.500	126.000	<0.02	<0.005	<0.02	<0.02	0.128	<0.02	0.032	0.209
Chloroform	11.200	12.500	11.400	3.090	4.900	7.020	0.044	0.018	0.277	1.880	0.764	0.221	0.242	0.310
Methylene chloride	<0.25	<0.25	<0.25	<0.25	<1	<2.5	<0.1	<0.025	<0.1	<0.1	<0.1	<0.1	<0.025	0.007
Chloromethane	<0.5	<0.5	<0.5	<0.5	<2	<5	<0.2	<0.05	<0.2	<0.2	<0.2	<0.2	<0.05	<0.01
Total Chlorinate Methanes	**113.200**	**141.500**	**160.400**	**78.290**	**86.400**	**133.020**	**0.044**	**0.018**	**0.277**	**1.880**	**0.892**	**0.221**	**0.274**	**0.526**
Pentachloroethane	0.178	0.611	0.291	0.180	0.266	<0.5	<0.02	<0.005	<0.02	<0.02	0.085	<0.02	0.011	0.004
1.1.1.2-Tetrachloroethane	<0.05	<0.05	<0.05	<0.05	<0.2	<0.5	<0.02	<0.005	<0.02	<0.02	<0.02	<0.02	<0.005	<0.001
1.1.2.2-Tetrachloroethane	0.962	1.320	1.070	0.328	0.508	1.830	<0.02	<0.005	1.660	1.280	4.470	10.100	2.700	0.077
1.1.1-Trichloroethane	0.071	0.105	0.109	<0.05	<0.2	<0.5	0.354	0.075	0.620	<0.02	<0.02	<0.02	<0.005	<0.001
1.1.2-Trichloroethane	1.980	2.770	2.040	0.476	1.050	1.720	<0.02	<0.005	0.061	5.340	1.860	0.255	0.148	0.040
1.1-Dichloroethane	0.082	0.078	0.096	<0.05	<0.2	<0.5	0.757	0.664	0.357	0.034	<0.02	<0.02	0.019	0.020
1.2-Dichloroethane	2.080	1.770	5.390	7.480	1.660	1.080	0.310	0.202	0.134	0.390	0.262	0.245	0.620	0.455
Chloroethane	<0.5	<0.5	<0.5	<0.5	<2	<5	<0.2	<0.05	<0.2	<0.2	<0.2	<0.2	<0.05	<0.01
Total Chlorinated Ethanes	**5.353**	**6.654**	**8.996**	**8.464**	**3.484**	**4.630**	**1.421**	**0.941**	**2.832**	**7.044**	**6.677**	**10.600**	**3.498**	**0.596**
Tetrachloroethene	60.600	120.000	93.900	85.800	113.000	233.000	<0.02	0.006	0.041	11.400	11.500	2.730	1.340	1.020
Trichloroethene	5.810	8.070	8.260	3.690	5.980	9.780	0.058	0.011	0.302	1.920	20.600	28.300	4.420	0.661
1.1-Dichloroethene	0.080	0.071	0.072	<0.05	<0.2	<0.5	0.270	0.026	0.630	<0.02	0.053	0.206	0.020	0.007
cis-1.2-Dichloroethene	0.781	1.110	0.559	0.161	0.732	1.720	26.000	2.620	27.800	2.620	0.250	4.040	0.510	1.070
trans-1.2-Dichloroethene	0.079	0.108	0.095	<0.05	<0.2	<0.5	6.270	1.700	3.170	0.059	0.047	0.407	0.038	0.034
Vinyl chloride	0.980	0.800	0.670	<0.5	<2	<5	34.000	20.500	27.200	0.940	<0.2	2.340	0.110	0.170
Total Clorinated Ethenes	**68.330**	**130.159**	**103.556**	**89.651**	**119.712**	**244.500**	**66.598**	**24.863**	**59.143**	**16.939**	**32.450**	**38.023**	**6.438**	**2.962**
Total Volatile CHCs	**186.883**	**278.313**	**272.952**	**176.405**	**209.596**	**382.150**	**68.063**	**25.822**	**62.252**	**25.863**	**40.019**	**48.844**	**10.210**	**4.084**
Carbon disulfide	2.680	2.800	2.940	0.964	1.150	2.610	0.057	0.020	0.038	0.179	0.121	0.050	0.034	0.040

Table 2
Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	BP106	BP106	BP90	BP90	BP90	BP90	BP90	BP90	BP90	BP90	BP90	MWD16D	MWD16I	MWD16S
Depth	**18**	**20**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**19**			
Date	**09-Nov-05**	**09-Nov-05**	**07-Feb-06**	**07-Feb-06**	**07-Feb-06**	**07-Feb-06**	**07-Feb-06**	**07-Feb-06**	**07-Feb-06**	**07-Feb-06**	**07-Feb-06**	**02-Dec-05**	**02-Dec-05**	**02-Dec-05**
Carbon Tetrachloride	0.033	0.208	<0.05	0.028	5.300	4.370	3.500	0.173	0.479	1.160	<0.2	235.000	462.000	301.000
Chloroform	0.236	1.240	2.220	1.960	1.600	1.240	1.570	0.165	0.279	3.660	2.120	3.450	12.600	12.000
Methylene chloride	<0.005	<0.025	<0.25	<0.1	<0.1	<0.1	<0.1	<0.25	<0.25	<1	<1	<1	<1	<1
Chloromethane	<0.01	<0.05	<0.5	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<2	<2	<2	<2	<2
Total Chlorinate Methanes	**0.269**	**1.448**	**2.220**	**1.988**	**6.900**	**5.610**	**5.070**	**0.338**	**0.758**	**4.820**	**2.120**	**238.450**	**474.600**	**313.000**
Pentachloroethane	0.006	<0.005	<0.05	<0.02	0.580	0.531	0.383	<0.05	0.051	<0.2	<0.2	0.966	0.380	0.600
1.1.1.2-Tetrachloroethane	<0.001	<0.005	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.2	<0.2	<0.2	<0.2	<0.2
1.1.2.2-Tetrachloroethane	0.122	0.818	0.200	8.080	15.900	12.700	13.100	0.852	1.180	19.000	6.120	2.320	6.130	8.690
1.1.1-Trichloroethane	<0.001	<0.005	2.690	0.311	1.620	1.150	1.330	0.355	1.400	4.090	2.240	<0.2	<0.2	<0.2
1.1.2-Trichloroethane	0.106	0.065	0.528	0.275	0.186	0.139	0.154	<0.05	0.070	0.855	0.909	10.800	41.300	53.700
1.1-Dichloroethane	0.024	0.035	0.625	0.488	0.234	0.156	0.201	<0.05	<0.05	0.483	0.706	<0.2	0.319	0.251
1.2-Dichloroethane	0.508	1.390	1.010	4.520	0.431	0.325	0.419	0.067	0.154	1.460	8.690	8.180	44.800	4.430
Chloroethane	<0.01	<0.05	<0.5	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<2	<2	<2	<2	<2
Total Chlorinated Ethanes	**0.766**	**2.308**	**5.053**	**13.674**	**18.951**	**15.001**	**15.587**	**1.274**	**2.855**	**25.888**	**18.665**	**22.266**	**92.929**	**67.671**
Tetrachloroethene	0.931	1.940	10.400	0.774	13.400	10.500	6.300	4.060	27.500	17.000	12.600	74.900	122.000	197.000
Trichloroethene	0.401	1.620	85.500	18.600	14.600	12.700	16.500	76.000	178.000	463.000	371.000	1.360	3.070	3.640
1.1-Dichloroethene	0.007	0.007	0.605	0.132	2.090	1.640	1.790	0.298	0.707	3.640	3.180	<0.2	0.568	0.550
cis-1.2-Dichloroethene	0.506	0.398	2.300	4.900	26.700	21.400	29.000	1.640	2.940	7.870	8.480	<0.2	0.453	0.387
trans-1.2-Dichloroethene	0.036	0.077	0.246	0.156	0.235	0.148	0.188	0.055	0.130	1.110	1.300	<0.2	<0.2	<0.2
Vinyl chloride	0.130	0.100	0.660	1.040	0.470	0.330	0.450	<0.5	<0.5	<2	<2	<2	<2	<2
Total Clorinated Ethenes	**2.011**	**4.142**	**99.711**	**25.602**	**57.495**	**46.718**	**54.228**	**82.053**	**209.277**	**492.620**	**396.560**	**76.260**	**126.091**	**201.577**
Total Volatile CHCs	**3.046**	**7.898**	**106.984**	**41.264**	**83.346**	**67.329**	**74.885**	**83.665**	**212.890**	**523.328**	**417.345**	**336.976**	**693.620**	**582.248**
Carbon disulfide	0.028	0.086	<0.05	<0.02	0.158	0.107	0.044	<0.05	<0.05	0.298	<0.2	0.500	1.210	1.360

Table 2
Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	WG204D	WG204I	WG204S	WG205D	WG206D	WG206I	WG206S	WG207D	WG207I	WG207S	WG208D	WG208I	WG208S	WG209D
Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Date	07-Feb-06	07-Feb-06	07-Feb-06	07-Feb-06	24-Jan-06	24-Jan-06	24-Jan-06	24-Jan-06	24-Jan-06	24-Jan-06	24-Jan-06	24-Jan-06	24-Jan-06	08-Feb-06
Carbon Tetrachloride	<0.001	<0.005	0.012	0.018	<0.005	0.276	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.005	0.004
Chloroform	0.002	0.076	0.393	0.019	0.006	0.075	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.005	0.001
Methylene chloride	<0.005	<0.025	<0.025	<0.025	<0.025	<0.25	<0.005	<0.005	<0.005	<0.005	<0.025	<0.005	<0.025	<0.005
Chloromethane	<0.01	<0.05	<0.05	<0.05	<0.05	<0.5	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01
Total Chlorinate Methanes	**0.002**	**0.076**	**0.405**	**0.037**	**0.006**	**0.351**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**0.005**
Pentachloroethane	<0.001	<0.005	<0.005	<0.005	<0.005	0.798	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.005	<0.001
1.1.1.2-Tetrachloroethane	<0.001	<0.005	<0.005	<0.005	<0.005	<0.05	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.005	<0.001
1.1.2.2-Tetrachloroethane	0.001	<0.005	<0.005	<0.005	0.044	<0.05	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.005	<0.001
1.1.1-Trichloroethane	<0.001	<0.005	<0.005	<0.005	<0.005	<0.05	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.005	<0.001
1.1.2-Trichloroethane	<0.001	<0.005	<0.005	<0.005	<0.005	<0.05	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.005	<0.001
1.1-Dichloroethane	0.001	<0.005	<0.005	0.007	0.005	<0.05	0.009	<0.001	<0.001	0.001	<0.005	<0.001	<0.005	<0.001
1.2-Dichloroethane	0.056	<0.005	0.006	0.236	0.006	<0.05	0.001	0.198	0.383	<0.001	<0.005	<0.001	<0.005	0.016
Chloroethane	<0.01	<0.05	<0.05	<0.05	<0.05	<0.5	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.05	<0.01
Total Chlorinated Ethanes	**0.058**	**0.000**	**0.006**	**0.243**	**0.055**	**0.798**	**0.010**	**0.198**	**0.383**	**0.001**	**0.000**	**0.000**	**0.000**	**0.016**
Tetrachloroethene	0.001	0.015	0.072	7.000	0.160	14.800	0.003	0.741	0.541	0.002	1.220	0.005	1.350	0.132
Trichloroethene	0.004	0.320	0.876	0.081	0.637	3.290	0.007	0.156	0.079	0.003	0.471	0.004	0.404	0.021
1.1-Dichloroethene	<0.001	<0.005	0.012	<0.005	<0.005	<0.05	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.005	0.001
cis-1.2-Dichloroethene	0.013	3.760	5.790	0.032	1.220	2.520	0.003	0.016	0.011	0.004	0.262	0.005	0.249	0.029
trans-1.2-Dichloroethene	<0.001	0.048	0.066	<0.005	0.032	<0.05	<0.001	0.003	0.002	<0.001	0.025	<0.001	0.024	0.002
Vinyl chloride	0.020	1.250	2.220	<0.05	<0.05	<0.5	<0.01	<0.01	<0.01	<0.01	0.140	<0.01	0.140	<0.01
Total Clorinated Ethenes	**0.038**	**5.393**	**9.036**	**7.113**	**2.049**	**20.610**	**0.013**	**0.916**	**0.633**	**0.009**	**2.118**	**0.014**	**2.167**	**0.185**
Total Volatile CHCs	**0.098**	**5.469**	**9.447**	**7.393**	**2.110**	**21.759**	**0.023**	**1.114**	**1.016**	**0.010**	**2.118**	**0.014**	**2.167**	**0.206**
Carbon disulfide	<0.001	<0.005	0.010	<0.005	0.006	0.096	0.005	0.010	0.012	0.001	<0.005	<0.001	<0.005	<0.001

Table 2
Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	WG209I	WG209S	WG210D	WG210I	WG210S	WG212D	WG212I	WG212S	WG213D	WG213I	WG213S
Depth	-	-	-	-	-	-	-	-	-	-	-
Date	**08-Feb-06**	**08-Feb-06**	**08-Feb-06**	**08-Feb-06**	**08-Feb-06**	**08-Feb-06**	**08-Feb-06**	**08-Feb-06**	**07-Feb-06**	**07-Feb-06**	**07-Feb-06**
Carbon Tetrachloride	0.008	0.021	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.05	<0.5	<0.001
Chloroform	0.002	0.063	0.002	<0.001	<0.001	0.008	0.008	0.021	1.020	2.610	<0.001
Methylene chloride	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.25	<2.5	<0.005
Chloromethane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.5	<5	<0.01
Total Chlorinate Methanes	**0.010**	**0.084**	**0.002**	**0.000**	**0.000**	**0.008**	**0.008**	**0.024**	**1.020**	**2.610**	**0.000**
Pentachloroethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.5	<0.001
1.1.1.2-Tetrachloroethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.5	<0.001
1.1.2.2-Tetrachloroethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.05	<0.5	<0.001
1.1.1-Trichloroethane	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	0.001	0.001	0.434	3.130	<0.001
1.1.2-Trichloroethane	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.118	0.771	<0.001
1.1-Dichloroethane	<0.001	0.004	0.002	0.002	0.005	0.003	0.005	0.002	0.277	0.576	0.021
1.2-Dichloroethane	<0.001	<0.001	0.060	0.010	<0.001	0.004	<0.001	<0.001	218.000	1200.000	0.010
Chloroethane	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.5	<5	<0.01
Total Chlorinated Ethanes	**0.000**	**0.007**	**0.062**	**0.012**	**0.005**	**0.007**	**0.006**	**0.003**	**218.829**	**1204.477**	**0.031**
Tetrachloroethene	0.316	0.771	0.001	0.047	<0.001	0.006	0.041	0.068	0.130	2.280	<0.001
Trichloroethene	0.070	1.150	0.005	0.007	<0.001	0.027	0.091	0.026	3.210	17.400	0.004
1.1-Dichloroethene	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	0.002	<0.001	0.114	0.992	0.002
cis-1.2-Dichloroethene	0.078	0.076	0.004	0.128	0.004	0.098	0.538	0.006	0.731	3.000	0.008
trans-1.2-Dichloroethene	<0.001	0.001	0.004	0.003	<0.001	0.003	0.006	<0.001	0.058	<0.5	0.004
Vinyl chloride	0.020	<0.01	<0.01	<0.01	<0.01	0.120	0.260	<0.01	3.420	16.300	0.130
Total Clorinated Ethenes	**0.484**	**1.998**	**0.014**	**0.187**	**0.004**	**0.254**	**0.938**	**0.100**	**7.663**	**39.972**	**0.148**
Total Volatile CHCs	**0.494**	**2.089**	**0.078**	**0.199**	**0.009**	**0.269**	**0.952**	**0.127**	**227.512**	**1247.059**	**0.179**
Carbon disulfide	0.001	<0.001	<0.001	0.004	<0.001	0.002	0.001	<0.001	<0.05	<0.5	0.002

Table 3
Semi-Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP104	BP104
Depth	3	5	7	9	11	13	15	17	19	21	23	25	2	4
Date	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05
1.2.4.5-Tetrachlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.2.4-Trichlorobenzene	<0.002	<0.002	<0.002	0.003	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.2-Dichlorobenzene	<0.002	<0.002	<0.002	0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.3.5-Trichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.3-Dichlorobenzene	<0.002	<0.002	<0.002	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.4-Dichlorobenzene	<0.002	0.004	<0.002	0.005	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002
Hexachlorobenzene (HCB)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Hexachlorobutadiene	<0.002	0.009	0.028	0.037	0.005	0.011	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.05
Hexachlorocyclopentadiene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachloroethane	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	0.003
Hexachloropropylene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Pentachlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

Table 3
Semi-Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	BP104	BP104	BP104	BP104	BP104	BP104	BP104	BP104	BP104	BP104	BP105	BP105	BP105	BP105
Depth	6	8	10	12	14	16	18	20	22	24	3	5	7	9
Date	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	8-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05
1.2.4.5-Tetrachlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.2.4-Trichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.2-Dichlorobenzene	<0.002	<0.002	0.003	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	0.005
1.3.5-Trichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.02	<0.002	<0.002	<0.002
1.3-Dichlorobenzene	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.003	0.002
1.4-Dichlorobenzene	<0.002	0.003	0.005	0.005	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.01	0.008
Hexachlorobenzene (HCB)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.169	0.035	<0.004
Hexachlorobutadiene	0.21	0.065	0.457	0.076	0.074	0.908	0.859	0.017	0.012	<0.002	<0.002	0.508	0.085	0.041
Hexachlorocyclopentadiene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachloroethane	0.362	0.132	0.238	0.128	0.215	0.643	0.413	0.046	<0.002	0.002	<0.002	0.617	0.822	0.503
Hexachloropropylene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Pentachlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

Table 3
Semi-Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	BP105	BP105	BP105	BP105	BP105	BP105	BP106	BP106	BP106	BP106	BP106	BP106	BP106	BP106
Depth	11	13	15	17	19	21	2	4	6	8	10	12	14	16
Date	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05	9-Nov-05
1.2.4.5-Tetrachlorobenzene	<0.002	0.01	<0.024	<0.005	<0.05	<0.05	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.2.4-Trichlorobenzene	<0.002	0.031	<0.024	<0.005	0.112	0.141	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.2-Dichlorobenzene	0.006	0.075	0.053	0.01	0.184	0.323	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002
1.3.5-Trichlorobenzene	<0.002	<0.01	<0.024	<0.005	<0.05	<0.05	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.3-Dichlorobenzene	0.003	0.041	0.03	0.005	0.117	0.186	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.4-Dichlorobenzene	0.011	0.162	0.116	0.022	0.422	0.698	<0.002	<0.002	<0.002	0.004	0.004	<0.002	<0.002	<0.002
Hexachlorobenzene (HCB)	0.221	13.2	12.7	1.59	45.7	70.3	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Hexachlorobutadiene	0.681	45.3	40.7	5.02	176	242	<0.002	<0.002	<0.002	0.191	0.125	0.004	0.172	0.21
Hexachlorocyclopentadiene	<0.01	<0.01	<0.02	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachloroethane	1.61	15.2	45	6.2	56.6	88.6	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002
Hexachloropropylene	<0.002	0.059	0.032	<0.005	0.226	0.34	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Pentachlorobenzene	<0.002	0.027	<0.024	<0.005	0.097	0.113	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

Table 3
Semi-Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	BP106	BP106	BP90	BP90	BP90	BP90	BP90	BP90	BP90	BP90	BP90	MWD16D	MWD16I	MWD16S
Depth	18	20	4	6	8	10	12	14	16	18	19	-	-	-
Date	9-Nov-05	9-Nov-05	7-Feb-06	7-Feb-06	7-Feb-06	7-Feb-06	7-Feb-06	7-Feb-06	7-Feb-06	7-Feb-06	7-Feb-06	2-Dec-05	2-Dec-05	2-Dec-05
1.2.4.5-Tetrachlorobenzene	<0.002	<0.002	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-
1.2.4-Trichlorobenzene	<0.002	<0.002	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-
1.2-Dichlorobenzene	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-
1.3.5-Trichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-
1.3-Dichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-
1.4-Dichlorobenzene	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-
Hexachlorobenzene (HCB)	<0.004	<0.004	0.011	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.006	-	-	-
Hexachlorobutadiene	0.043	0.096	0.934	0.309	0.094	0.097	0.099	0.084	0.16	0.079	0.152	<0.2	0.5	5.65
Hexachlorocyclopentadiene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-
Hexachloroethane	<0.002	<0.002	0.035	0.004	0.066	0.054	0.037	0.005	0.049	0.022	0.022	-	-	-
Hexachloropropylene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-
Pentachlorobenzene	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-

Table 3
Semi-Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	WG204D	WG204I	WG204S	WG205D	WG206D	WG206I	WG206S	WG207D	WG207I	WG207S	WG208D	WG208I	WG208S	WG209D
Depth	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Date	7-Feb-06	7-Feb-06	7-Feb-06	7-Feb-06	########	########	########	########	########	########	########	########	########	8-Feb-06
1.2.4.5-Tetrachlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.2.4-Trichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.2-Dichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.3.5-Trichlorobenzene	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.3-Dichlorobenzene	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.4-Dichlorobenzene	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Hexachlorobenzene (HCB)	<0.004	<0.004	<0.004	<0.004	0.505	3.67	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Hexachlorobutadiene	0.004	0.043	0.109	0.004	4.7	14.9	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002
Hexachlorocyclopentadiene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachloroethane	<0.002	<0.002	<0.002	0.015	0.004	3.75	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Hexachloropropylene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Pentachlorobenzene	<0.002	<0.002	<0.002	<0.002	0.009	0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

Table 3
Semi-Volatile CHC Concentrations in Groundwater (mg/L)
Southern Plumes DNAPL Source Area Investigation - February 2006

Sample ID	WG209I	WG209S	WG210D	WG210I	WG210S	WG212D	WG212I	WG212S	WG213D	WG213I	WG213S
Depth	-	-	-	-	-	-	-	-	-	-	-
Date	8-Feb-06	8-Feb-06	8-Feb-06	8-Feb-06	8-Feb-06	8-Feb-06	8-Feb-06	8-Feb-06	7-Feb-06	7-Feb-06	7-Feb-06
1.2.4.5-Tetrachlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.2.4-Trichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.2-Dichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.3.5-Trichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.3-Dichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
1.4-Dichlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002
Hexachlorobenzene (HCB)	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Hexachlorobutadiene	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Hexachlorocyclopentadiene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Hexachloroethane	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Hexachloropropylene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Pentachlorobenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

Table 4
Total Percentage Solubility of CHCs (%)
Southern Plumes DNAPL Source Area Investigation - February 2006

Location	Pure	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103	BP103
Depth	Solubility	3	5	7	9	11	13	15	17	19	21	23
Date Sampled	(mg/L)	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05
1.1.1.2-Tetrachloroethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.1-Trichloroethane	1360	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.2.2-Tetrachloroethane	2900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
1.1.2-Trichloroethane	4500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
1.1-Dichloroethane	5060	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloroethene	2250	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloropropylene	-	-	-	-	-	-	-	-	-	-	-	-
1.2.3-Trichloropropane	1900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dibromo-3-chloropropane	1230	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichloroethane	8690	0.0	1.1	0.0	7.2	8.3	3.5	2.1	1.7	0.9	40.4	0.0
1.3-Dichloropropane	2700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromodichloromethane	4500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromoform	3100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromomethane	13200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carbon disulfide	2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carbon Tetrachloride	800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloroethane	5700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloroform	8000	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloromethane	5325	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cis-1.2-Dichloroethene	3500	0.0	0.2	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0
cis-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	11400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dichlorodifluoromethane	9500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iodomethane	14000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachloroethane	480	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tetrachloroethene	150	0.0	0.8	0.0	0.3	1.2	1.6	0.2	0.1	0.0	3.5	0.0
trans-1.2-Dichloroethene	6300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
trans-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	1100	0.0	0.4	0.2	0.5	0.5	0.4	0.2	0.1	0.1	3.0	0.0
Trichlorofluoromethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vinyl chloride	2700	0.0	0.3	0.1	0.9	0.9	0.2	0.2	0.2	0.1	1.5	0.0
1.2.4.5-Tetrachlorobenzene	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2.4-Trichlorobenzene	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichlorobenzene	150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3.5-Trichlorobenzene	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3-Dichlorobenzene	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.4-Dichlorobenzene	123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachlorobenzene (HCB)	0.005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachlorobutadiene	3.23	0.0	0.3	0.9	1.1	0.2	0.3	0.0	0.0	0.0	0.0	0.0
Hexachlorocyclopentadiene	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachloroethane	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachloropropylene	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachlorobenzene	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total % Volatiles		0.0	2.9	0.3	9.2	11.2	5.7	2.8	2.0	1.2	49.5	0.1
Total % Semi-Volatiles		0.0	0.3	0.9	1.2	0.2	0.3	0.0	0.0	0.0	0.0	0.0
Total % Solubility		0.0	3.2	1.2	10.3	11.4	6.1	2.8	2.0	1.2	49.5	0.1

Table 4
Total Percentage Solubility of CHCs (%)
Southern Plumes DNAPL Source Area Investigation - February 2006

Location	Pure	BP103	BP104	BP104	BP104	BP104	BP104	BP104	BP104	BP104	BP104	BP104
Depth	Solubility	25	2	4	6	8	10	12	14	16	18	20
Date Sampled	(mg/L)	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05	08-Nov-05
1.1.1.2-Tetrachloroethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.1-Trichloroethane	1360	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.2.2-Tetrachloroethane	2900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7
1.1.2-Trichloroethane	4500	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
1.1-Dichloroethane	5060	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloroethene	2250	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloropropylene	-	-	-	-	-	-	-	-	-	-	-	-
1.2.3-Trichloropropane	1900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dibromo-3-chloropropane	1230	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichloroethane	8690	0.4	0.0	0.3	0.7	5.2	5.0	3.4	1.8	1.8	2.9	10.9
1.3-Dichloropropane	2700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromodichloromethane	4500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromoform	3100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromomethane	13200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carbon disulfide	2100	0.0	0.0	0.0	0.3	0.3	0.1	0.2	0.1	0.0	0.0	0.0
Carbon Tetrachloride	800	0.0	0.0	0.2	19.4	16.8	7.2	6.7	3.7	0.2	0.4	0.1
Chloroethane	5700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloroform	8000	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1
Chloromethane	5325	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cis-1.2-Dichloroethene	3500	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
cis-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	11400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dichlorodifluoromethane	9500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iodomethane	14000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachloroethane	480	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tetrachloroethene	150	0.0	0.0	0.1	41.1	53.6	51.3	45.3	23.8	7.9	10.6	2.4
trans-1.2-Dichloroethene	6300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
trans-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	1100	0.1	0.0	0.7	0.1	0.4	0.6	0.4	0.3	0.4	0.4	4.0
Trichlorofluoromethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vinyl chloride	2700	0.1	0.0	0.3	0.2	0.6	0.7	0.5	0.2	0.1	0.1	0.3
1.2.4.5-Tetrachlorobenzene	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2.4-Trichlorobenzene	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichlorobenzene	150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3.5-Trichlorobenzene	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3-Dichlorobenzene	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.4-Dichlorobenzene	123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachlorobenzene (HCB)	0.005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachlorobutadiene	3.23	0.0	0.0	1.5	6.5	2.0	14.1	2.4	2.3	28.1	26.6	0.5
Hexachlorocyclopentadiene	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachloroethane	50	0.0	0.0	0.0	0.7	0.3	0.5	0.3	0.4	1.3	0.8	0.1
Hexachloropropylene	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachlorobenzene	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total % Volatiles		0.7	0.0	2.2	62.0	77.0	65.0	56.8	30.0	10.3	14.4	20.1
Total % Semi-Volatiles		0.0	0.0	1.6	7.2	2.3	14.6	2.6	2.7	29.4	27.4	0.6
Total % Solubility		0.7	0.0	3.8	69.2	79.2	79.6	59.4	32.7	39.7	41.8	20.8

Table 4
Total Percentage Solubility of CHCs (%)
Southern Plumes DNAPL Source Area Investigation - February 2006

Location	Pure	BP104	BP104	BP105	BP105	BP105	BP105	BP105	BP105	BP105	BP105
Depth	Solubility	22	24	3	5	7	9	11	13	15	17	19
Date Sampled	(mg/L)	08-Nov-05	08-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05
1.1.1.2-Tetrachloroethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.1-Trichloroethane	1360	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.2.2-Tetrachloroethane	2900	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.2-Trichloroethane	4500	0.2	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0
1.1-Dichloroethane	5060	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloroethene	2250	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloropropylene	-	-	-	-	-	-	-	-	-	-	-	-
1.2.3-Trichloropropane	1900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dibromo-3-chloropropane	1230	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichloroethane	8690	2.5	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
1.3-Dichloropropane	2700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromodichloromethane	4500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromoform	3100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromomethane	13200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carbon disulfide	2100	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Carbon Tetrachloride	800	0.0	0.3	0.0	8.3	15.0	12.6	12.8	16.1	18.6	9.4	10.2
Chloroethane	5700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloroform	8000	0.1	0.1	0.0	0.1	0.2	0.1	0.1	0.2	0.1	0.0	0.1
Chloromethane	5325	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cis-1.2-Dichloroethene	3500	0.7	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
cis-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	11400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dichlorodifluoromethane	9500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iodomethane	14000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachloroethane	480	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.0	0.1
Tetrachloroethene	150	1.0	0.1	0.0	22.1	55.6	38.6	40.4	80.0	62.6	57.2	75.3
trans-1.2-Dichloroethene	6300	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
trans-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	1100	5.8	0.8	0.0	1.0	1.8	0.5	0.5	0.7	0.8	0.3	0.5
Trichlorofluoromethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vinyl chloride	2700	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2.4.5-Tetrachlorobenzene	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
1.2.4-Trichlorobenzene	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.3
1.2-Dichlorobenzene	150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
1.3.5-Trichlorobenzene	6	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3-Dichlorobenzene	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
1.4-Dichlorobenzene	123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.3
Hexachlorobenzene (HCB)	0.005	0.0	0.0	0.0	3380.0	700.0	0.0	4420	264000	254000	31800	914000
Hexachlorobutadiene	3.23	0.4	0.0	0.0	15.7	2.6	1.3	21.1	1402.5	1260.1	155.4	5448.9
Hexachlorocyclopentadiene	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachloroethane	50	0.0	0.0	0.0	1.2	1.6	1.0	3.2	30.4	90.0	12.4	113.2
Hexachloropropylene	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.0	1.3
Pentachlorobenzene	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	9.7
Total % Volatiles		13.2	3.0	0.0	31.8	72.9	52.3	54.2	97.5	82.5	67.2	86.3
Total % Semi-Volatiles		0.4	0.0	0.3	3397.0	704.3	2.3	4444	265438	255350	31968	919574
Total % Solubility		13.6	3.0	0.3	**3428.7**	**777.2**	54.5	**4498**	**265536**	**255433**	**32035**	**919660**

Table 4
Total Percentage Solubility of CHCs (%)
Southern Plumes DNAPL Source Area Investigation - February 2006

Location	Pure	BP105	BP106	BP106	BP106	BP106	BP106	BP106	BP106	BP106	BP106	BP106
Depth	Solubility	21	2	4	6	8	10	12	14	16	18	20
Date Sampled	(mg/L)	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05	09-Nov-05
1.1.1.2-Tetrachloroethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.1-Trichloroethane	1360	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.2.2-Tetrachloroethane	2900	0.1	0.0	0.0	0.1	0.0	0.2	0.3	0.1	0.0	0.0	0.0
1.1.2-Trichloroethane	4500	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloroethane	5060	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloroethene	2250	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloropropylene	-	-	-	-	-	-	-	-	-	-	-	-
1.2.3-Trichloropropane	1900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dibromo-3-chloropropane	1230	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichloroethane	8690	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3-Dichloropropane	2700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromodichloromethane	4500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromoform	3100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromomethane	13200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carbon disulfide	2100	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carbon Tetrachloride	800	15.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloroethane	5700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloroform	8000	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloromethane	5325	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cis-1.2-Dichloroethene	3500	0.0	0.7	0.1	0.8	0.1	0.0	0.1	0.0	0.0	0.0	0.0
cis-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	11400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dichlorodifluoromethane	9500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iodomethane	14000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachloroethane	480	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tetrachloroethene	150	155.3	0.0	0.0	0.0	7.6	7.7	1.8	0.9	0.7	0.6	1.3
trans-1.2-Dichloroethene	6300	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
trans-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	1100	0.9	0.0	0.0	0.0	0.2	1.9	2.6	0.4	0.1	0.0	0.1
Trichlorofluoromethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vinyl chloride	2700	0.0	1.3	0.8	1.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
1.2.4.5-Tetrachlorobenzene	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2.4-Trichlorobenzene	40	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichlorobenzene	150	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3.5-Trichlorobenzene	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3-Dichlorobenzene	80	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.4-Dichlorobenzene	123	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachlorobenzene (HCB)	0.005	140600	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachlorobutadiene	3.23	7492.3	0.0	0.0	0.0	5.9	3.9	0.1	5.3	6.5	1.3	3.0
Hexachlorocyclopentadiene	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachloroethane	50	177.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachloropropylene	17	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachlorobenzene	1	11.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total % Volatiles		172.3	2.2	0.9	2.1	8.1	9.8	5.0	1.4	0.8	0.7	1.5
Total % Semi-Volatiles		141368	0.0	0.0	0.0	5.9	3.9	0.1	5.3	6.5	1.3	3.0
Total % Solubility		141385	2.2	0.9	2.1	14.0	13.7	5.1	6.8	7.3	2.0	4.5

Table 4
Total Percentage Solubility of CHCs (%)
Southern Plumes DNAPL Source Area Investigation - February 2006

Location	Pure	BP90	BP90	BP90	BP90	BP90	BP90	BP90	BP90	BP90	MWD16I	MWD16
Depth	Solubility	4	6	8	10	12	14	16	18	19		
Date Sampled	(mg/L)	07-Feb-06	07-Feb-06	07-Feb-06	07-Feb-06	07-Feb-06	07-Feb-06	07-Feb-06	07-Feb-06	07-Feb-06	02-Dec-05	02-Dec-05
1.1.1.2-Tetrachloroethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.1-Trichloroethane	1360	0.2	0.0	0.1	0.1	0.1	0.0	0.1	0.3	0.2	0.0	0.0
1.1.2.2-Tetrachloroethane	2900	0.0	0.3	0.5	0.4	0.5	0.0	0.0	0.7	0.2	0.1	0.2
1.1.2-Trichloroethane	4500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.9
1.1-Dichloroethane	5060	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloroethene	2250	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.2	0.1	0.0	0.0
1.1-Dichloropropylene	-	-	-	-	-	-	-	-	-	-	-	-
1.2.3-Trichloropropane	1900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dibromo-3-chloropropane	1230	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichloroethane	8690	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.5
1.3-Dichloropropane	2700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromodichloromethane	4500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromoform	3100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromomethane	13200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carbon disulfide	2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Carbon Tetrachloride	800	0.0	0.0	0.7	0.5	0.4	0.0	0.1	0.1	0.0	29.4	57.8
Chloroethane	5700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloroform	8000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Chloromethane	5325	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cis-1.2-Dichloroethene	3500	0.1	0.1	0.8	0.6	0.8	0.0	0.1	0.2	0.2	0.0	0.0
cis-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	11400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dichlorodifluoromethane	9500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iodomethane	14000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachloroethane	480	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.1
Tetrachloroethene	150	6.9	0.5	8.9	7.0	4.2	2.7	18.3	11.3	8.4	49.9	81.3
trans-1.2-Dichloroethene	6300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
trans-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	1100	7.8	1.7	1.3	1.2	1.5	6.9	16.2	42.1	33.7	0.1	0.3
Trichlorofluoromethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vinyl chloride	2700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2.4.5-Tetrachlorobenzene	0.5	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
1.2.4-Trichlorobenzene	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
1.2-Dichlorobenzene	150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
1.3.5-Trichlorobenzene	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
1.3-Dichlorobenzene	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
1.4-Dichlorobenzene	123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Hexachlorobenzene (HCB)	0.005	220.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	120.0	-	-
Hexachlorobutadiene	3.23	28.9	9.6	2.9	3.0	3.1	2.6	5.0	2.4	4.7	0.0	15.5
Hexachlorocyclopentadiene	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Hexachloroethane	50	0.1	0.0	0.1	0.1	0.1	0.0	0.1	0.0	0.0	-	-
Hexachloropropylene	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Pentachlorobenzene	1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
Total % Volatiles		15.1	2.8	12.6	10.1	7.7	9.8	34.9	55.0	43.1	80.1	141.3
Total % Semi-Volatiles		249.7	10.0	3.0	3.1	3.1	2.6	5.1	2.5	124.7	0.0	15.5
Total % Solubility		**264.8**	12.8	15.7	13.2	10.9	12.4	39.9	57.5	**167.8**	80.1	**156.8**

Table 4
Total Percentage Solubility of CHCs (%)
Southern Plumes DNAPL Source Area Investigation - February 2006

Location	Pure	MWD16S	WG204D	WG204I	WG204S	WG205D	WG206D	WG206I	WG206S	WG207D	WG207I	WG207S
Depth	Solubility		-	-	-	-	-	-	-	-	-	-
Date Sampled	(mg/L)	02-Dec-05	07-Feb-06	07-Feb-06	07-Feb-06	07-Feb-06	24-Jan-06	24-Jan-06	24-Jan-06	24-Jan-06	24-Jan-06	24-Jan-06
1.1.1.2-Tetrachloroethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.1-Trichloroethane	1360	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.2.2-Tetrachloroethane	2900	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.2-Trichloroethane	4500	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloroethane	5060	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloroethene	2250	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloropropylene	-	-	-	-	-	-	-	-	-	-	-	-
1.2.3-Trichloropropane	1900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dibromo-3-chloropropane	1230	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichloroethane	8690	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3-Dichloropropane	2700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromodichloromethane	4500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromoform	3100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromomethane	13200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carbon disulfide	2100	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carbon Tetrachloride	800	37.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloroethane	5700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloroform	8000	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloromethane	5325	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cis-1.2-Dichloroethene	3500	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0	0.0
cis-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	11400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dichlorodifluoromethane	9500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iodomethane	14000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachloroethane	480	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Tetrachloroethene	150	131.3	0.0	0.0	0.0	4.7	0.1	9.9	0.0	0.5	0.4	0.0
trans-1.2-Dichloroethene	6300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
trans-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	1100	0.3	0.0	0.0	0.1	0.0	0.1	0.3	0.0	0.0	0.0	0.0
Trichlorofluoromethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vinyl chloride	2700	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2.4.5-Tetrachlorobenzene	0.5	-	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0
1.2.4-Trichlorobenzene	40	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichlorobenzene	150	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3.5-Trichlorobenzene	6	-	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3-Dichlorobenzene	80	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.4-Dichlorobenzene	123	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachlorobenzene (HCB)	0.005	-	0.0	0.0	0.0	0.0	10100	73400	0.0	0.0	0.0	0.0
Hexachlorobutadiene	3.23	174.9	0.1	1.3	3.4	0.1	146	461	0.0	0.0	0.1	0.0
Hexachlorocyclopentadiene	1.8	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachloroethane	50	-	0.0	0.0	0.0	0.0	0.0	7.5	0.0	0.0	0.0	0.0
Hexachloropropylene	17	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachlorobenzene	1	-	0.0	0.0	0.0	0.0	0.9	2.0	0.0	0.0	0.0	0.0
Total % Volatiles		171.2	0.0	0.2	0.4	4.7	0.2	10.4	0.0	0.5	0.4	0.0
Total % Semi-Volatiles		174.9	0.1	1.3	3.4	0.2	10246	73872	0.0	0.0	0.1	0.0
Total % Solubility		346.1	0.1	1.5	3.8	4.8	10247	73882	0.0	0.5	0.5	0.0

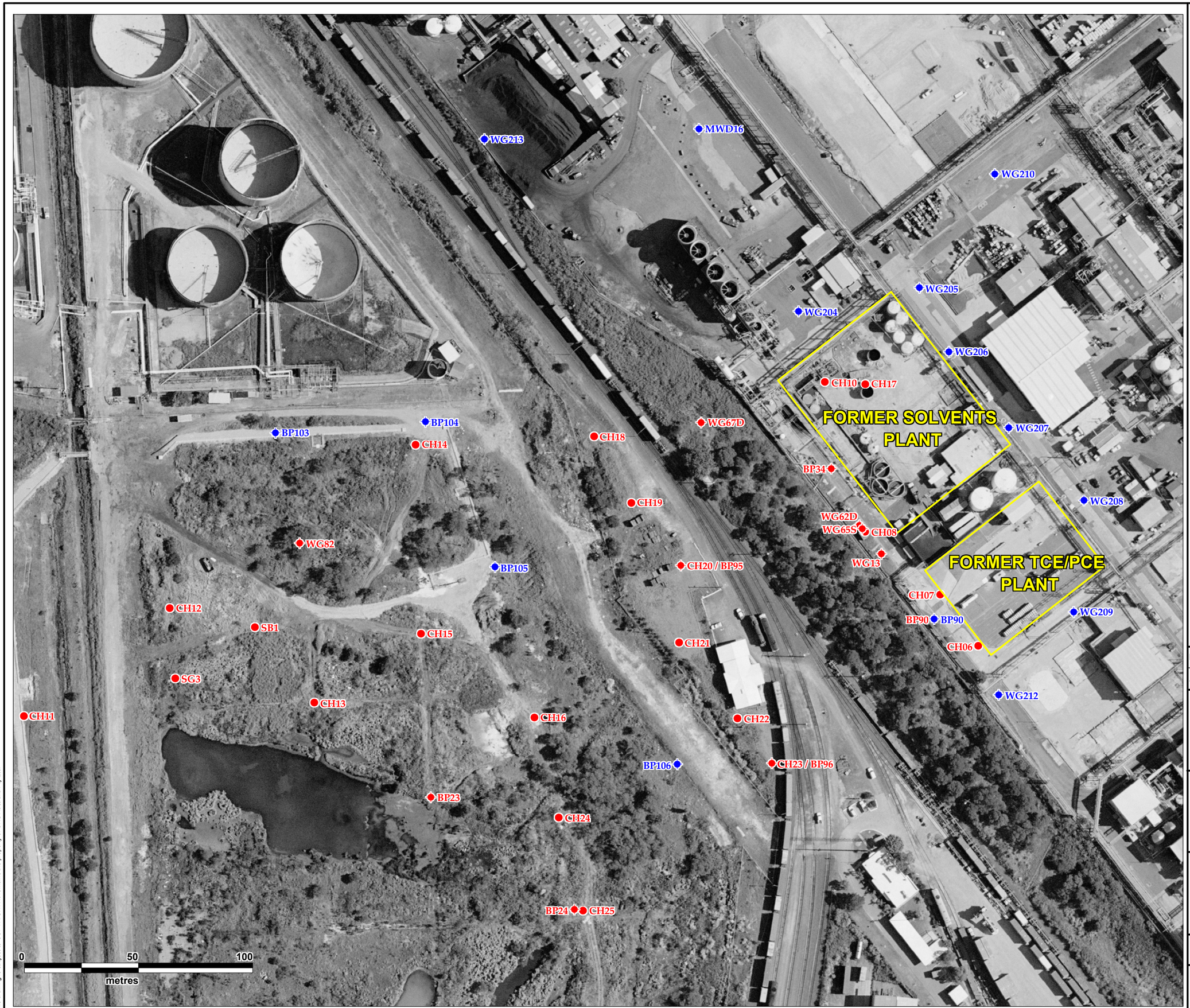
Table 4
Total Percentage Solubility of CHCs (%)
Southern Plumes DNAPL Source Area Investigation - February 2006

Location	Pure	WG208D	WG208I	WG208S	WG209D	WG209I	WG209S	WG210D	WG210I	WG210S	WG212D	WG212I
Depth	Solubility	-	-	-	-	-	-	-	-	-	-	-
Date Sampled	(mg/L)	24-Jan-06	24-Jan-06	24-Jan-06	08-Feb-06	08-Feb-06	08-Feb-06	08-Feb-06	08-Feb-06	08-Feb-06	08-Feb-06	08-Feb-06
1.1.1.2-Tetrachloroethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.1-Trichloroethane	1360	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.2.2-Tetrachloroethane	2900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1.2-Trichloroethane	4500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloroethane	5060	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloroethene	2250	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.1-Dichloropropylene	-	-	-	-	-	-	-	-	-	-	-	-
1.2.3-Trichloropropane	1900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dibromo-3-chloropropane	1230	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichloroethane	8690	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3-Dichloropropane	2700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromodichloromethane	4500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromoform	3100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bromomethane	13200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carbon disulfide	2100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carbon Tetrachloride	800	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloroethane	5700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloroform	8000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chloromethane	5325	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cis-1.2-Dichloroethene	3500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
cis-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-	-	-	-	-	-	-	-
Dibromomethane	11400	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dichlorodifluoromethane	9500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iodomethane	14000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachloroethane	480	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tetrachloroethene	150	0.8	0.0	0.9	0.1	0.2	0.5	0.0	0.0	0.0	0.0	0.0
trans-1.2-Dichloroethene	6300	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
trans-1.4-Dichloro-2-butene	-	-	-	-	-	-	-	-	-	-	-	-
Trichloroethene	1100	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Trichlorofluoromethane	1100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vinyl chloride	2700	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2.4.5-Tetrachlorobenzene	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2.4-Trichlorobenzene	40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.2-Dichlorobenzene	150	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3.5-Trichlorobenzene	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.3-Dichlorobenzene	80	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.4-Dichlorobenzene	123	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachlorobenzene (HCB)	0.005	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachlorobutadiene	3.23	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Hexachlorocyclopentadiene	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachloroethane	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hexachloropropylene	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pentachlorobenzene	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total % Volatiles		0.9	0.0	0.9	0.1	0.2	0.6	0.0	0.0	0.0	0.0	0.1
Total % Semi-Volatiles		0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total % Solubility		0.9	0.0	0.9	0.1	0.2	0.7	0.0	0.0	0.0	0.0	0.1

Table 4
Total Percentage Solubility of CHCs (%)
Southern Plumes DNAPL Source Area Investigation - February 2006

Location	Pure	WG212S	WG213D	WG213I	WG213S
Depth	Solubility	-	-	-	-
Date Sampled	(mg/L)	08-Feb-06	07-Feb-06	07-Feb-06	07-Feb-06
1.1.1.2-Tetrachloroethane	1100	0.0	0.0	0.0	0.0
1.1.1-Trichloroethane	1360	0.0	0.0	0.2	0.0
1.1.2.2-Tetrachloroethane	2900	0.0	0.0	0.0	0.0
1.1.2-Trichloroethane	4500	0.0	0.0	0.0	0.0
1.1-Dichloroethane	5060	0.0	0.0	0.0	0.0
1.1-Dichloroethene	2250	0.0	0.0	0.0	0.0
1.1-Dichloropropylene	-	-	-	-	-
1.2.3-Trichloropropane	1900	0.0	0.0	0.0	0.0
1.2-Dibromo-3-chloropropane	1230	0.0	0.0	0.0	0.0
1.2-Dichloroethane	8690	0.0	2.5	13.8	0.0
1.3-Dichloropropane	2700	0.0	0.0	0.0	0.0
Bromodichloromethane	4500	0.0	0.0	0.0	0.0
Bromoform	3100	0.0	0.0	0.0	0.0
Bromomethane	13200	0.0	0.0	0.0	0.0
Carbon disulfide	2100	0.0	0.0	0.0	0.0
Carbon Tetrachloride	800	0.0	0.0	0.0	0.0
Chloroethane	5700	0.0	0.0	0.0	0.0
Chloroform	8000	0.0	0.0	0.0	0.0
Chloromethane	5325	0.0	0.0	0.0	0.0
cis-1.2-Dichloroethene	3500	0.0	0.0	0.1	0.0
cis-1.4-Dichloro-2-butene	-	-	-	-	-
Dibromochloromethane	-	-	-	-	-
Dibromomethane	11400	0.0	0.0	0.0	0.0
Dichlorodifluoromethane	9500	0.0	0.0	0.0	0.0
Iodomethane	14000	0.0	0.0	0.0	0.0
Pentachloroethane	480	0.0	0.0	0.0	0.0
Tetrachloroethene	150	0.0	0.1	1.5	0.0
trans-1.2-Dichloroethene	6300	0.0	0.0	0.0	0.0
trans-1.4-Dichloro-2-butene	-	-	-	-	-
Trichloroethene	1100	0.0	0.3	1.6	0.0
Trichlorofluoromethane	1100	0.0	0.0	0.0	0.0
Vinyl chloride	2700	0.0	0.1	0.6	0.0
1.2.4.5-Tetrachlorobenzene	0.5	0.0	0.0	0.0	0.0
1.2.4-Trichlorobenzene	40	0.0	0.0	0.0	0.0
1.2-Dichlorobenzene	150	0.0	0.0	0.0	0.0
1.3.5-Trichlorobenzene	6	0.0	0.0	0.0	0.0
1.3-Dichlorobenzene	80	0.0	0.0	0.0	0.0
1.4-Dichlorobenzene	123	0.0	0.0	0.0	0.0
Hexachlorobenzene (HCB)	0.005	0.0	0.0	0.0	0.0
Hexachlorobutadiene	3.23	0.0	0.0	0.0	0.0
Hexachlorocyclopentadiene	1.8	0.0	0.0	0.0	0.0
Hexachloroethane	50	0.0	0.0	0.0	0.0
Hexachloropropylene	17	0.0	0.0	0.0	0.0
Pentachlorobenzene	1	0.0	0.0	0.0	0.0
Total % Volatiles		0.0	3.1	17.9	0.0
Total % Semi-Volatiles		0.0	0.0	0.0	0.0
Total % Solubility		0.0	3.1	17.9	0.0

Figures



Legend

- Bundle Piezometer Location/ Groundwater Monitoring Well Location
- Core Hole/ Cone Penetrometer Test Hole Location
- 2005 Investigation Locations
- Pre 2005 Investigation Locations

Source: SKM Aerial Imager, 2005
Datum: GDA94, Projection:UTM, Grid: MGA Zone 56

Drawn: ST	Approved: DRAFT	Date: 20-03-06
Job No: **43346038**	File: 43346038.001.wor	

Client

ORICA AUSTRALIA PTY LIMITED

Project

ORICA BOTANY ENVIRONMENTAL SURVEY - STAGE 4, REMEDIATION

Title

DNAPL SOURCE AREA INVESTIGTION LOCATIONS - SOUTHERN PLUMES

Figure: **1**

URS

Legend

- Bundle Piezometer Location/ Groundwater Monitoring Well Location
- Core Hole/ Cone Penetrometer Test Hole Location
- Calculated pore water concentrations of CHCs indicate DNAPL is present in soil.
- Positive Field Identification of DNAPL

Source: SKM Aerial Imagery, 2005
Datum: GDA94, Projection:UTM, Grid: MGA Zone 56

Drawn: ST	Approved: DRAFT	Date: 20-03-06
Job No: **43346038**	File: 43346038.002.wor	

Client

ORICA AUSTRALIA PTY LIMITED

Project

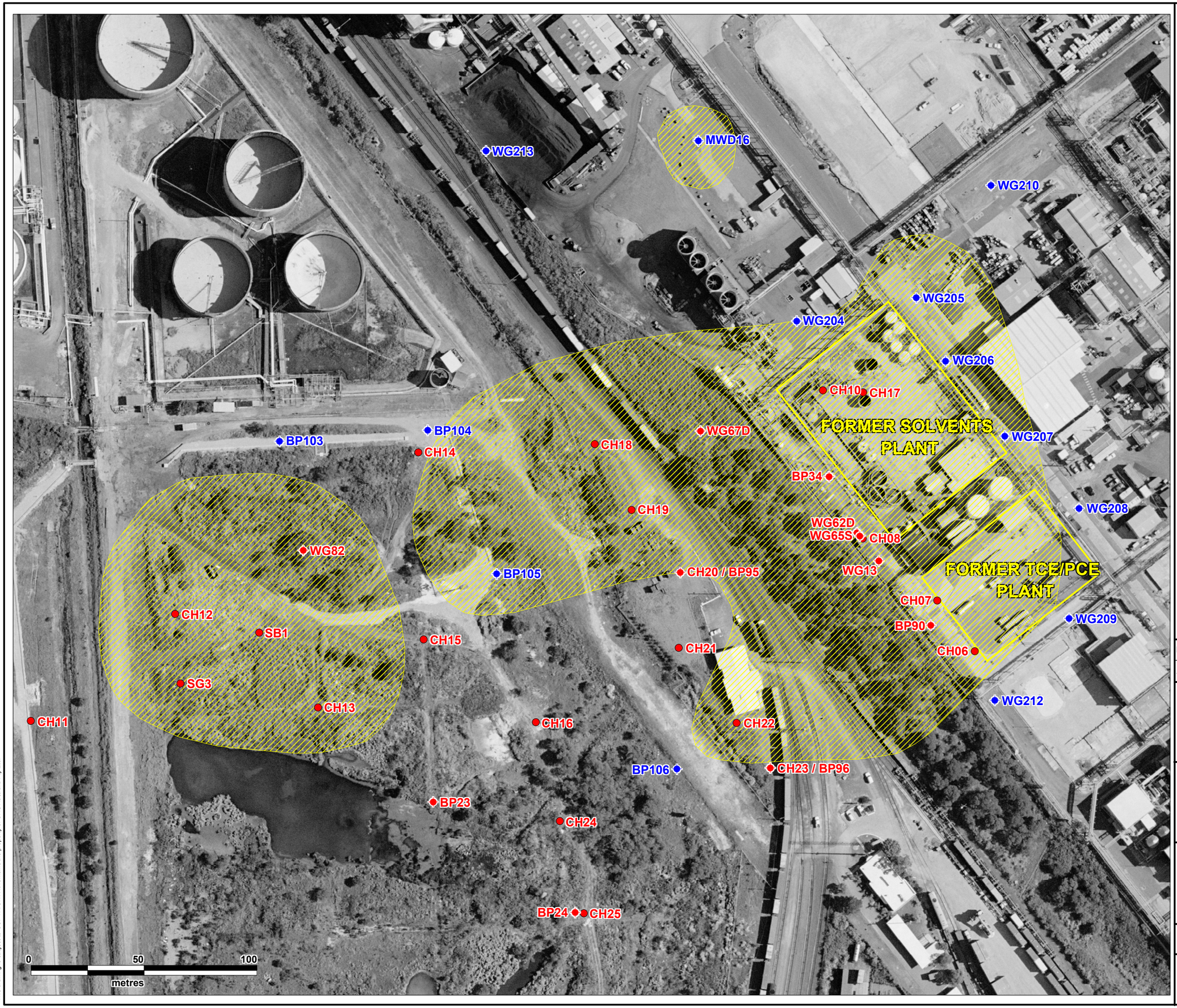
ORICA BOTANY ENVIRONMENTAL SURVEY - STAGE 4, REMEDIATION

Title

SOUTHERN PLUMES SOURCE AREAS- DNAPL LOCATIONS

Figure: **2**

URS



Legend

- Bundle Piezometer Location/ Groundwater Monitoring Well Location
- Core Hole/ Cone Penetrometer Test Hole Location
- 2005 Investigation Locations
- Pre-2005 Investigation Locations
- Inferred Extent of DNAPL Source Area

Source: SKM Aerial Imager, 2005
Datum: GDA94, Projection:UTM, Grid: MGA Zone 56

Drawn: ST	Approved: DRAFT	Date: 20-03-06
Job No: **43346038**	File: 43346038.003.wor	

Client

ORICA AUSTRALIA PTY LIMITED

Project

ORICA BOTANY ENVIRONMENTAL SURVEY - STAGE 4, REMEDIATION

Title

INFERRED EXTENT OF SOUTHERN PLUMES DNAPL SOURCE AREAS

Figure: **3**

URS

Appendix A
Soil Lithology and Monitoring Well Construction Logs

BUNDLE PIEZOMETER BP104

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: **DNAPL Investigation**

Project No.: **43346038**

Client: **Orica Australia**

Location: **Botany**

Drilling Contractor: **Adams Drillers**

Logged By:	J Morrow	Bore Size:	mm	Relative Level:	5.13 mAHD
Checked By:	S Tan	Total Depth:	25.50 m	Coordinates:	6241376.02 N
Date Started:	22-08-05	Casing Size:	50 mm		335290.03 E
Date Finished:	22-08-05			Permit No:	

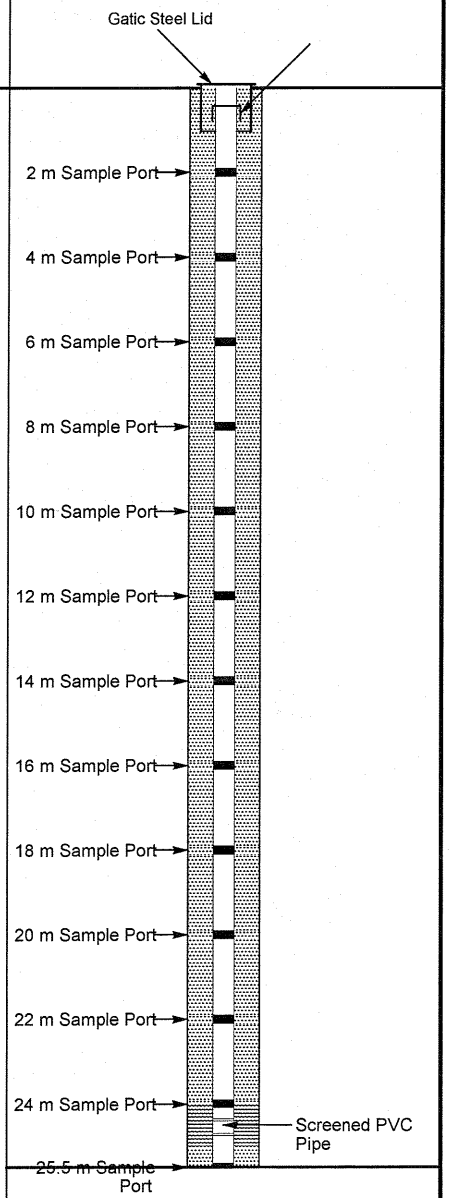
Drill Type: **Mud Casing**

Drill Model: **6000**

Drill Fluid: **Biopolymer Mud**

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition
				SAND/PEATY SAND: Brown-Dark brown, fine to medium grained, well graded.		0	
				PEAT: Dark Brown-Black.		5	
				SAND: Grey Brown, fine to medium, well graded. EDC odour below 7m.		6	
				PEAT: Dark Brown/Black.		8	
				SAND: Light yellow brown, fine to medium grained, well graded.		9	
				PEAT: Dark Brown/Black.		18	
				SAND: Light grey/white, fine to medium grained, well graded.		19	
				PEAT: Dark Brown/Black.		22	
				CLAY/SANDY CLAY: Light grey, motted grey /yellow - brown/red below 25 m (weathered sandstone). Odours indicative of Southern Plumes noted between 23 and 25 m bgl.		23	
				Refusal at 25.5 m on Sandstone Bedrock.		25	

WELL CONSTRUCTION DETAILS



Remarks: This bundle piezometer was installed using mud rotary drilling techniques. The lithological information provided is based on observation of the cuttings returned in the drilling mud so its accuracy is very limited.

BUNDLE PIEZOMETER BP103

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: **DNAPL Investigation**

Project No.: **43346038**

Client: **Orica Australia**

Location: **Botany**

Drilling Contractor: **Adams Drillers**

Logged By: **JM**	Bore Size: **mm**	Relative Level: **4.93 mAHD**	Drill Type: **Mud Casing**
Checked By: **S Tan**	Total Depth: **28.00 m**	Coordinates: **6241371.11 N**	Drill Model: **6000**
Date Started: **22-08-05**	Casing Size: **50 mm**	**335224.48 E**	Drill Fluid: **Biopolymer Mud**
Date Finished: **22-08-05**		Permit No:	

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition	WELL CONSTRUCTION DETAILS
				SAND/PEATY SAND: Dark brown/brown, fine to medium grained, well graded. Hard to distinguish any layers.		0–5		Gatic Steel Lid; 1 m Sample Port; 3 m Sample Port; 5 m Sample Port
				SAND: Light yellow brown, fine to medium grained, well graded.		6–13		7 m Sample Port; 9 m Sample Port; 11 m Sample Port; 13 m Sample Port
				PEAT: Dark brown/black.		14		
				SAND: Light grey/brown, fine to medium grained, well graded. EDC odour below 15m and extended throughout remainder of borehole.		15–23		15 m Sample Port; 17 m Sample Port; 19 m Sample Port; 21 m Sample Port; 23 m Sample Port
				CLAY/CLAYEY SAND: Grey/Dark grey, high plasticity clay with fine to medium grained sand, well graded.		24–27		25 m Sample Port; 27 m Sample Port
				Refusal at 28 m bgl on Sandstone Bedrock.		28–29		

Remarks: This bundle piezometer was installed using mud rotary drilling techniques. The lithological information provided is based on observation of the cuttings returned in the drilling mud so its accuracy is very limited.

BUNDLE PIEZOMETER J:\JOBS\43346038\BORELOGS\DNAPL2005.GPJ WCC_AUS.GDT 19/05/06

BUNDLE PIEZOMETER WG213

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Drilling Contractor: **Adams Drilling**

Project Reference: **DNAPL Investigation**

Project No.: **43346038**

Client: **Orica Australia**

Location: **Botany**

Logged By:	S Tan	Bore Size:	180 mm	Relative Level:	6.69 mAHD
Checked By:	A Woinarski	Total Depth:	22.50 m	Coordinates:	6241499.44 N
Date Started:	12-10-05	Casing Size:	mm		335315.79 E
Date Finished:	12-10-05			Permit No:	

Drill Type: **Rotary Mud**

Drill Model: **Edson 6k**

Drill Fluid: **Biopolymer mud**

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition	WELL CONSTRUCTION DETAILS
				Asphalt		0		
				FILL: sand				
				SAND: light brown, grey, fine grained		1		
						2		
				PEAT: black, soft, weak CHC odour		3		SCREENED PVC PIPE
				SAND: grey-brown, fine grained		4		
						5		
						6		BENTONITE
						7		
				Intermittent thin peat layers between 8 and 17 m bgl. Not possible to tell the exact depths.		8		
						9		
						10		
						11		SCREENED PVC PIPE
						12		
						13		
						14		BENTONITE
						15		
						16		
				SAND: light grey, white, fine grained		17		
						18		
						19		SCREENED PVC PIPE
						20		
						21		
				CLAY: light grey, white		22		
				EOH @ 22.5 - Refusal on Sandstone Bedrock		23		
						24		

BUNDLE PIEZOMETER J:\JOBS\43346038\BORELOGS\DNAPL2005.GPJ WCC_AUS.GDT 19/05/06

BUNDLE PIEZOMETER WG210

URS

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: **DNAPL Investigation**

Project No.: **43346038**

Client: **Orica Australia**

Location: **Botany**

Drilling Contractor: **Adams Drilling**

Logged By: **T Onus**	Bore Size: **180 mm**	Relative Level: **9.23 mAHD**	Drill Type: **Rotary Mud**
Checked By: **A Woinarski**	Total Depth: **21.50 m**	Coordinates: **6241484.26 N**	Drill Model: **Edson 6k**
Date Started: **11-10-05**	Casing Size: **mm**	**335538.92 E**	Drill Fluid: **Biopolymer mud**
Date Finished: **11-10-05**		Permit No:	

Sample Interval / PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition	WELL CONSTRUCTION DETAILS
			FILL: ash, sand and peaty sand, light brown to dark brown, fine to medium grained sand.		0		
			SAND: fine to medium grained, some coarse gravel, dark grey, well graded		1–2		
			PEAT: black, hydrogen sulphide odour		3		SCREENED PVC PIPE
			SAND: fine grained, light grey		4–6		BENTONITE
					7–11		SCREENED PVC PIPE
			SAND: fine grained, dark grey, with some black peat, hydrogen sulphide odour		12–13		BENTONITE
			Becoming light grey below 18m		14–18		SCREENED PVC PIPE
			Sandy CLAY: coarse sand, dark grey clay		19–20		
			Weathered SANDSTONE: grey, some orange and yellow mottling, coarse sand.		21		
			EOH @ 21.5 m - Refusal		22–24		

BUNDLE PIEZOMETER WG212

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: **DNAPL Investigation**

Project No.: **43346038**

Client: **Orica Australia**

Location: **Botany**

Drilling Contractor: **Adams Drilling**

Logged By:	ST	Bore Size:	180 mm	Relative Level:	9.34 mAHD
Checked By:	J Morrow	Total Depth:	19.00 m	Coordinates:	6241256.73 N
Date Started:	14-09-05	Casing Size:	mm		335540.67 E
Date Finished:	14-09-05			Permit No:	

Drill Type: **Rotary Mud**

Drill Model: **Edson 6k**

Drill Fluid: **Biopolymer Mud**

Sample Interval / PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition	WELL CONSTRUCTION DETAILS
			SAND: Light brown/grey, fine grained.		0		BENTONITE
					1		
					2		
					3		SCREENED PVC PIPE
					4		
			PEAT: Black, soft consistency.		5		BENTONITE
			SAND: Light brown/grey, fine grained, slight hydrocarbon odour.		6		
					7		
					8		
					9		SCREENED PVC PIPE
					10		
					11		
			PEAT: Black.		12		BENTONITE
			SAND: Light brown/grey, fine grained.		13		
					14		
					15		
					16		SCREENED PVC PIPE
			SANDY CLAY: Weathered sandstone, mottled orange/red, grey, yellow and purple, firm, hydrocarbon odour.		17		
					18		
			EOH at 19m. Sandstone bedrock encountered.		19		
					20		
					21		
					22		
					23		
					24		

BUNDLE PIEZOMETER J:\JOBS\43346038\BORELOGS\DNAPL2005.GPJ WCC_AUS.GDT 19/05/06

BUNDLE PIEZOMETER BP105

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: **DNAPL Investigation**

Project No.: **43346038**

Client: **Orica Australia**

Location: **Botany**

Drilling Contractor: **Adams Drillers**

Logged By: **FQ**
Checked By: **J Morrow**
Date Started: **19-08-05**
Date Finished: **19-08-05**

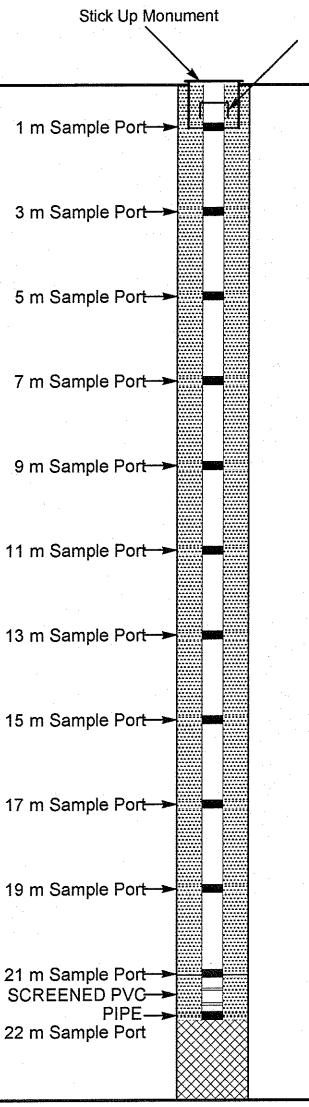
Bore Size: **mm**
Total Depth: **24.00 m**
Casing Size: **50 mm**

Relative Level: **5.50 mAHD**
Coordinates: **6241312.51 N**
335320.43 E
Permit No:

Drill Type: **Mud Casing**
Drill Model: **6000**
Drill Fluid: **Biopolymer Mud**

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations	Classification	Depth (m)	Moisture Condition
				FILL: Sand, grey-brown, fine to medium grained, some building fragments.		0–2	
				SAND: Brown, fine to medium grained, well sorted, subrounded, low plasticity.		2–5	
				Some peat in cuttings between 4-6 m bgl indicating possible peat layer.		5–8	
				Sand changed from brown to light brown at 8m bgl.		8–16	
				Sand changed from light brown to grey-brown between 16-17m bgl.		16–22	
				PEAT: Dark brown-black.		22–23	
				CLAYEY SAND: Brown, fine to medium grained, medium plasticity.		23–24	
				Refusal at 24 m on Sandstone Bedrock.		24–29	

WELL CONSTRUCTION DETAILS



Remarks: This bundle piezometer was installed using mud rotary drilling techniques. The lithological information provided is based on observation of the cuttings returned in the drilling mud so its accuracy is very limited.

BUNDLE PIEZOMETER BP106

URS Australia Pty. Ltd.
Level 3, 116 Miller Street, North Sydney
Phone: 02 8925 5500
Fax: 02 8925 5555

Project Reference: **DNAPL Investigation**

Project No.: **43346038**

Client: **Orica Australia**

Location: **Botany**

Drilling Contractor: **Adams Drillers**

Logged By:	**FQ**	Bore Size:	**mm**
Checked By:	**J Morrow**	Total Depth:	**23.00 m**
Date Started:	**23-08-05**	Casing Size:	**50 mm**
Date Finished:	**23-08-05**		

Relative Level: **5.71 mAHD**

Coordinates: **6241226.38 N**
335399.97 E

Permit No:

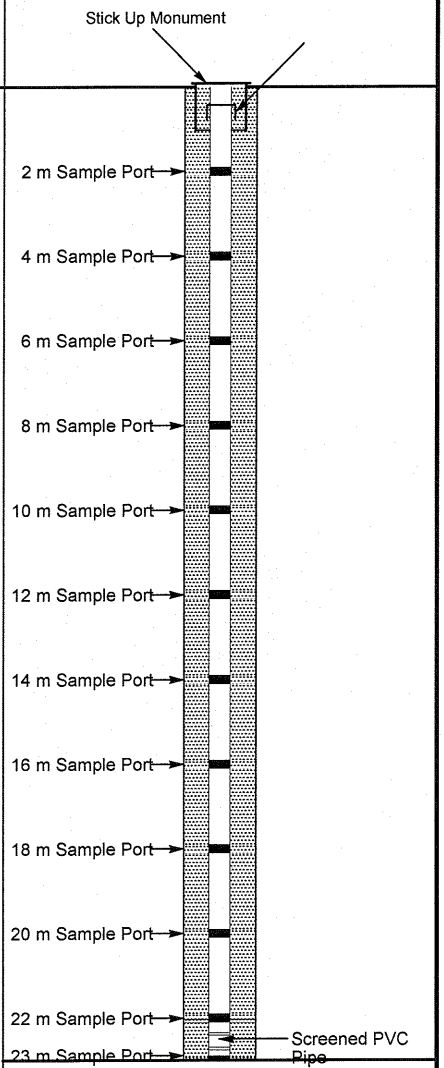
Drill Type: **Mud Casing**

Drill Model: **6000**

Drill Fluid: **Biopolymer Mud**

Sample Interval	PID (ppm)	Sample ID	Legend	USC DESCRIPTION OF STRATA (Type, plasticity / particle size, colour, secondary / minor components (e.g., "trace"), moisture content, consistency / density, and additional observations)	Classification	Depth (m)	Moisture Condition
				PEATY SAND: Dark brown, fine to medium grained.		0–2	
				PEAT: Dark brown - black, high plasticity.		2–3	
				PEATY SAND: Dark brown, fine to medium grained.		3–4	
				SAND: Brown, well graded, fine to medium grained, subrounded.		4–6	
				PEATY SAND: Dark brown, subrounded, fine to medium grained, well graded.		6–7	
				SAND: Brown, fine to medium grained, subrounded, well graded.		7–15	
				Sand changed from brown to grey-brown at 15 m bgl.		15–16	
				Sand changed from grey-brown to brown at 16m bgl.		16–22	
				CLAYEY SAND: Grey-brown, fine to medium grained, well graded, subrounded.		22–23	
				Refusal at 23 m bgl on Sandstone Bedrock.		23–29	

WELL CONSTRUCTION DETAILS



Remarks: This bundle piezometer was installed using mud rotary drilling techniques. The lithological information provided is based on observation of the cuttings returned in the drilling mud so its accuracy is very limited.

Appendix B
Data Validation Forms

URS

Analytical Data Validation Form

Project Name:	Orica DNAPL Source Area 2006	**Project/Task Number:**	43346038.07901
Analytical Laboratory:	ALS	**Batch/Ref. Number(s):**	ES0509495

Sample Type	No. of Primary Samples Analysed	QA/QC Samples	Analytes
Water	20		Volatile CHCs, Semi-volatile CHCs

Sample Handling and Receipt	Yes/No	Comments
COC completed adequately.	Yes	Acceptable.
Samples received by laboratory intact and cold.	Yes	
Date(s) Sampled: 09/11/05	Date Received at laboratory: 10/11/05	

Sample Holding Times	Yes/No	Comments
Samples analysed within appropriate holding times per analytical methods.	No	Acceptable.
Date(s) Sampled: 09/11/05	Date(s) Extracted: 13/11/05	

Method Blank (MB), Rinsate Blank (RB), Trip Blank (TB), Field Blank (FB), Trip Spike (TS)
(MB) taken form all Batches. (TB, RB, & FB)

Type	Comments
MB	Acceptable. No Method blank result outliers occur.

Laboratory Control Samples (LCS)

Analyte	% R	Comments
Volatile CHCs and Semi-volatile CHCs	39.5-108	Acceptable. No Laboratory Control Sample recovery outliers occur.

Matrix Spike (MS)

Analyte	% R	Comments
Volatile CHCs and Semi-volatile CHCs	86.4-93.5	Acceptable. No Matrix Spike recovery outliers occur.

Duplicates — Duplicates taken from BP106_02.00 and BP105_03.00

Laboratory Duplicates	RPD %	Comments
Volatile CHCs and Semi-volatile CHCs	0-16.7	Acceptable. No RPD recovery outliers occur for the duplicate analysis.

Inter-Laboratory Duplicates	RPD %	Comments
NA		

Intra-Laboratory Duplicates	RPD %	Comments
NA		

Surrogate Monitoring Compound Analyses

Analyte	% R	Comments
VOC surrogates	93.2-113	Acceptable within control limits with 1 exceedence 1.2 Dichloroethane-D4 of 115%
Acid Extractable	29-105	Acceptable within control limits
Base/Neutral Extractable	69.3-124	Acceptable within control limits with 1 exceedence Nitrobenzene D% of 114%

Overall Assessment

Various samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly

Various samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly

ND surrogate recoveries not determined due to matrix interferences

Surrogates -VOC surrogates - One slight exceedence for 1,2 Dichloroethane 115% (115% surrogate control limits). Base/Neutral surrogates - One slight exceedence for Nitrobenzene-D5 115% (114% surrogate control limits)

The results of the QA/QC procedures indicate that the results of the chemical analysis can be relied upon for the purposes of the groundwater monitoring program.

Notes: %R = Percent Recovery, RPD = Relative Percent Difference, LOR = Limit of Reporting
%AveR = Average Percentage Recovery

Performed By: Norm Ronis
Date: 20/02/06

Reviewed By: James Morrow
Date: 16/3/06

URS

Analytical Data Validation Form

Project Name:	Orica DNAPL Source Area 2006	**Project/Task Number:**	43346038.07901
Analytical Laboratory:	ALS	**Batch/Ref. Number(s):**	ES0509439

Sample Type	No. of Primary Samples Analysed	QA/QC Samples	Analytes
Water	24	2 Field Duplicates 1 Trip Blank	Volatile CHCs, Semi-volatile CHCs

Sample Handling and Receipt	Yes/No	Comments
COC completed adequately.	Yes	Acceptable.
Samples received by laboratory intact and cold.	Yes	
Date(s) Sampled: 08/11/05	Date Received at laboratory: 09/11/05	

Sample Holding Times	Yes/No	Comments
Samples analysed within appropriate holding times per analytical methods.	No	No - 1 day late but ok. Compositional analysis
Date(s) Sampled: 08/11/05	Date(s) Extracted: 10-11/11/05	

Method Blank (MB), Rinsate Blank (RB), Trip Blank (TB), Field Blank (FB), Trip Spike (TS)
(MB) taken form all Batches. (TB, RB, & FB)

Type	Comments
MB	Acceptable. No Method blank result outliers occur for both batches
FB	Acceptable. No Field blank result outliers occur for both batches

Laboratory Control Samples (LCS)

Analyte	% R	Comments
Volatile CHCs and Semi-volatile CHCs	38.8-122%	Acceptable. No Laboratory Control Sample recovery outliers occur.

Matrix Spike (MS)

Analyte	% R	Comments
Volatile CHCs and Semi-volatile CHCs	86.8-104%	Acceptable. No Matrix Spike recovery outliers occur.

Duplicates — Duplicates taken from BP103_03.00, BP103_23, BP104_18.00 and anonymous batches.

Laboratory Duplicates	RPD %	Comments
Volatile CHCs and Semi-volatile CHCs	0-15.2	Acceptable. No RPD recovery outliers occur for the duplicate analysis.

Inter-Laboratory Duplicates	RPD %	Comments
Two field duplicates - DUP04 = BP104_22.00 and DUP05 = BP104_24		
Volatile CHCs and Semi-volatile CHCs	0-22%	Acceptable. No RPD recovery outliers occur for the duplicate analysis.

Intra-Laboratory Duplicates	RPD %	Comments
NA		

Surrogate Monitoring Compound Analyses

Analyte	% R	Comments
VOC surrogates	96.9-114	Acceptable within control limits
Acid Extractable	23.3-120	Acceptable within control limits
Base/Neutral Extractable	70.5-107	Acceptable within control limits with 1 exceedence Nitrobenzene D% of 115%

Overall Assessment

Various samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly

Lab duplicate of BP104_18.00 for 1,2Dichloroethane analyte not determined in allocated original sample

Base/Neutral surrogates - One slight exceedence for Nitrobenzene-D5 115% (114% surrogate control limits) s

The results of the QA/QC procedures indicate that the results of the chemical analysis can be relied upon for the purposes of the groundwater monitoring program.

Notes: %R = Percent Recovery, RPD = Relative Percent Difference, LOR = Limit of Reporting
%AveR = Average Percentage Recovery

Performed By: Norm Ronis
Date: 20/02/06

Reviewed By: James Morrow
Date: 16/3/06

ES0509439
Field Duplicate Sample

Date Sampled			08/Nov/05	08/Nov/05	RPD
Sample Identification Number			BP104__22.00	DUP04	(%)
Analyte	Unit	LOR	Original	Duplicate	
Sulfonated Compounds					
Carbon Disulfide	µg/L	1	931	1120	18
Halogenated Aliphatic Hydrocarbons (VOL)					
Dichlorodifluoromethane	µg/L	10			--
Chloromethane	µg/L	10			--
Vinyl Chloride	µg/L	10	4010	4880	20
Bromomethane	µg/L	10			--
Chloroethane	µg/L	10			--
Trichlorofluoromethane	µg/L	10			--
1.1.-Dichloroethene	µg/L	1	413	480	15
Iodomethane	µg/L	1			--
Methylene Chloride	µg/L	1			--
trans-1.2-Dichloroethene	µg/L	1	8530	10300	19
1.1-Dichloroethane	µg/L	1			--
cis-1.2-Dichloroethene	µg/L	1	24900	29700	18
1.1.1-Trichloroethane	µg/L	1			--
1.1-Dichloropropylene	µg/L	1			--
Carbon tetrachloride	µg/L	1	257	322	22
1.2-Dichloroethane	µg/L	1	221000	213000	4
Trichloroethene	µg/L	1	64200	61700	4
Dibromomethane	µg/L	1			--
1.1.2-Trichloroethane	µg/L	1	8240	9770	17
1.3-Dichloropropane	µg/L	1			--
Tetrachloroethene	µg/L	1	1440	1750	19
1.1.1.2-Tetrachloroethane	µg/L	1			--
trans-1.4-Dichloro-2-butene	µg/L	1			--
cis-1.4-Dichloro-2-butene	µg/L	1			--
1.1.2.2-Tetrachloroethane	µg/L	1	73300	71200	3
1.2.3-Trichloropropane	µg/L	1			--
Pentachloroethane	µg/L	1			--
1.2-Dibromo-3-chloropropane	µg/L	1			--
Trihalomethanes					--
Chloroform	µg/L	1	7360	8950	19
Bromodichloromethane	µg/L	1			--
Dibromochloromethane	µg/L	1			--
Bromoform	µg/L	1			--
Chlorinated Hydrocarbons					
1.4-Dichlorobenzene	µg/L	2			--
1.3-Dichlorobenzene	µg/L	2			--
1.2-Dichlorobenzene	µg/L	2			--
Hexachloroethane	µg/L	2			--
1.2.4-Trichlorobenzene	µg/L	2			--
Hexachloropropylene	µg/L	2			--
Hexachlorobutadiene	µg/L	2	12	12	0
Hexachlorocyclopentadiene	µg/L	10			--
Pentachlorobenzene	µg/L	2			--
Hexachlorobenzene (HCB)	µg/L	4			--
Miscellaneous					
1.3.5-Trichlorobenzene	µg/L	2			--
1.2.4.5-Tetrachlorobenzene	µg/L	2			--

Notes:
-- = Result < Limit of Reporting (LOR)
- - - = No result for this analyte
RPD = Relative Percent Difference
Concentration between 10 & 20 times the LOR, 0-50%, >20 times LOR 0-20%
NA = Not Analysed
mg/kg = milligrams per kilogram
mg/L = milligrams per Litre
µg/L = micrograms per Litre

ES0509439
Field Duplicate Sample

Date Sampled			08/Nov/05	08/Nov/05	RPD
Sample Identification Number			BP104__24.00	DUP05	(%)
Analyte	Unit	LOR	Original	Duplicate	
Sulfonated Compounds					
Carbon Disulfide	µg/L	1	420	423	1
Halogenated Aliphatic Hydrocarbons (VOL)					
Dichlorodifluoromethane	µg/L	10			--
Chloromethane	µg/L	10			--
Vinyl Chloride	µg/L	10	6160	6240	1
Bromomethane	µg/L	10			--
Chloroethane	µg/L	10			--
Trichlorofluoromethane	µg/L	10			--
1.1.-Dichloroethene	µg/L	1	107	106	1
Iodomethane	µg/L	1			--
Methylene Chloride	µg/L	1	1140	1120	2
trans-1.2-Dichloroethene	µg/L	1	176	180	2
1.1-Dichloroethane	µg/L	1	194	187	4
cis-1.2-Dichloroethene	µg/L	1	7310	7310	0
1.1.1-Trichloroethane	µg/L	1			--
1.1-Dichloropropylene	µg/L	1			--
Carbon tetrachloride	µg/L	1	2640	2660	1
1.2-Dichloroethane	µg/L	1	98800	91600	8
Trichloroethene	µg/L	1	8270	8290	0
Dibromomethane	µg/L	1			--
1.1.2-Trichloroethane	µg/L	1	3140	3200	2
1.3-Dichloropropane	µg/L	1			--
Tetrachloroethene	µg/L	1	198	194	2
1.1.1.2-Tetrachloroethane	µg/L	1			--
trans-1.4-Dichloro-2-butene	µg/L	1			--
cis-1.4-Dichloro-2-butene	µg/L	1			--
1.1.2.2-Tetrachloroethane	µg/L	1	298	318	6
1.2.3-Trichloropropane	µg/L	1			--
Pentachloroethane	µg/L	1			--
1.2-Dibromo-3-chloropropane	µg/L	1			--
Trihalomethanes					
Chloroform	µg/L	1	10300	10200	1
Bromodichloromethane	µg/L	1			--
Dibromochloromethane	µg/L	1			--
Bromoform	µg/L	1			--
Chlorinated Hydrocarbons					
1.4-Dichlorobenzene	µg/L	2			
1.3-Dichlorobenzene	µg/L	2			
1.2-Dichlorobenzene	µg/L	2			
Hexachloroethane	µg/L	2	2	2	0
1.2.4-Trichlorobenzene	µg/L	2			
Hexachloropropylene	µg/L	2			
Hexachlorobutadiene	µg/L	2			
Hexachlorocyclopentadiene	µg/L	10			
Pentachlorobenzene	µg/L	2			
Hexachlorobenzene (HCB)	µg/L	4			
Miscellaneous					
1.3.5-Trichlorobenzene	µg/L	2			
1.2.4.5-Tetrachlorobenzene	µg/L	2			

Notes:
-- = Result < Limit of Reporting (LOR)
- - - = No result for this analyte
RPD = Relative Percent Difference
Concentration between 10 & 20 times the LOR, 0-50%, >20 times LOR 0-20%
NA = Not Analysed
mg/kg = milligrams per kilogram
mg/L = milligrams per Litre
µg/L = micrograms per Litre

URS

Analytical Data Validation Form

Project Name:	Orica DNAPL Source Area 2006	**Project/Task Number:**	43346038.07901
Analytical Laboratory:	ALS	**Batch/Ref. Number(s):**	ES0601470

Sample Type	No. of Primary Samples Analysed	QA/QC Samples	Analytes
Water	16	1 Field Duplicate	Volatile CHCs Semi-Volatile CHCs

Sample Handling and Receipt	Yes/No	Comments
COC completed adequately.	Yes	Acceptable.
Samples received by laboratory intact and cold.	Yes	
Date(s) Sampled: 07/02/06	Date Received at laboratory: 08/02/06	

Sample Holding Times	Yes/No	Comments
Samples analysed within appropriate holding times per analytical methods.	Yes	Acceptable
Date(s) Sampled: 07/02/06	Date(s) Extracted: 10/02/06	

Method Blank (MB), Rinsate Blank (RB), Trip Blank (TB), Field Blank (FB), Trip Spike (TS)
(MB) taken form all Batches. (TB, RB, & FB)

Type	Comments
MB	Acceptable. No Method blank result outliers occur for the batch

Laboratory Control Samples (LCS)

Analyte	% R	Comments
Volatile CHCs and Semi-volatile CHCs	23-110	Acceptable. No Laboratory Control Sample recovery outlier occur.

Matrix Spike (MS)

Analyte	% R	Comments
Volatile CHCs and Semi-volatile CHCs	84.9	Acceptable. No Matrix Spike recovery outliers occur, however MS recovery not determined, background level greater than or equal to 4X spike level

Duplicates — Duplicates taken from BP90_04.00 and WG204S

Laboratory Duplicates	RPD %	Comments
Volatile CHCs and Semi-volatile CHCs	0-32.2	Acceptable. No RPD recovery outliers occur for the duplicate analysis, due to results being less than 10X the LOR

Inter-Laboratory Duplicates	RPD %	Comments
One field duplicate - QC500 = WG205D		
Volatile CHCs and Semi-volatile CHCs	0-12%	Acceptable.No RPD recovery outliers occur for the duplicate analysis

Intra-Laboratory Duplicates	RPD %	Comments
NA		

Surrogate Monitoring Compound Analyses

Analyte	% R	Comments
VOC surrogates	89.8-113	Acceptable within control limits
Acid surrogates	21.6-103	Acceptable within control limits
Base surrogates	54.8-111	Acceptable within control limits

Overall Assessment

Various samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly

MS analysis - MS recovery not determined, background level greater than or equal to 4X spike level

The results of the QA/QC procedures indicate that the results of the chemical analysis can be relied upon for the purposes of the groundwater monitoring program.

Notes: %R = Percent Recovery, RPD = Relative Percent Difference, LOR = Limit of Reporting
%AveR = Average Percentage Recovery

Performed By: Norm Ronis
Date: 24/02/06

Reviewed By: James Morrow
Date: 16/3/06

ES0601470
Field Duplicate Sample

Date Sampled			07/Feb/06	07/Feb/06	RPD
Sample Identification Number			WG205D	QC500	(%)
Analyte	Unit	LOR	Original	Duplicate	
Sulfonated Compounds					
Carbon Disulfide	µg/L	1			
Halogenated Aliphatic Hydrocarbons (VOL)					
Dichlorodifluoromethane	µg/L	10			--
Chloromethane	µg/L	10			--
Vinyl Chloride	µg/L	10			
Bromomethane	µg/L	10			--
Chloroethane	µg/L	10			--
Trichlorofluoromethane	µg/L	10			--
1.1.-Dichloroethene	µg/L	1			
Iodomethane	µg/L	1			--
Methylene Chloride	µg/L	1			--
trans-1.2-Dichloroethene	µg/L	1			
1.1-Dichloroethane	µg/L	1	7	7	0
cis-1.2-Dichloroethene	µg/L	1	32	36	12
1.1.1-Trichloroethane	µg/L	1			--
1.1-Dichloropropylene	µg/L	1			--
Carbon tetrachloride	µg/L	1	18	18	0
1.2-Dichloroethane	µg/L	1	236	235	0
Trichloroethene	µg/L	1	81	80	1
Dibromomethane	µg/L	1			--
1.1.2-Trichloroethane	µg/L	1			
1.3-Dichloropropane	µg/L	1			--
Tetrachloroethene	µg/L	1	7000	6730	4
1.1.1.2-Tetrachloroethane	µg/L	1			--
trans-1.4-Dichloro-2-butene	µg/L	1			--
cis-1.4-Dichloro-2-butene	µg/L	1			--
1.1.2.2-Tetrachloroethane	µg/L	1			
1.2.3-Trichloropropane	µg/L	1			--
Pentachloroethane	µg/L	1			--
1.2-Dibromo-3-chloropropane	µg/L	1			--
Trihalomethanes					--
Chloroform	µg/L	1	19	20	5
Bromodichloromethane	µg/L	1			--
Dibromochloromethane	µg/L	1			--
Bromoform	µg/L	1			--
Chlorinated Hydrocarbons					
1.4-Dichlorobenzene	µg/L	2			--
1.3-Dichlorobenzene	µg/L	2			--
1.2-Dichlorobenzene	µg/L	2			--
Hexachloroethane	µg/L	2			--
1.2.4-Trichlorobenzene	µg/L	2			--
Hexachloropropylene	µg/L	2			--
Hexachlorobutadiene	µg/L	2			--
Hexachlorocyclopentadiene	µg/L	10			--
Pentachlorobenzene	µg/L	2			--
Hexachlorobenzene (HCB)	µg/L	4			--
Miscellaneous					
1.3.5-Trichlorobenzene	µg/L	2			--
1.2.4.5-Tetrachlorobenzene	µg/L	2			--

Notes:
-- = Result < Limit of Reporting (LOR)
- - - = No result for this analyte
RPD = Relative Percent Difference
Concentration between 10 & 20 times the LOR, 0-50%, >20 times LOR 0-20%
NA = Not Analysed
mg/kg = milligrams per kilogram
mg/L = milligrams per Litre
µg/L = micrograms per Litre

URS

Analytical Data Validation Form

Project Name:	Orica DNAPL Source Area 2006	**Project/Task Number:**	43346038.07901
Analytical Laboratory:	ALS	**Batch/Ref. Number(s):**	ES0600878

Sample Type	No. of Primary Samples Analysed	QA/QC Samples	Analytes
Water	9	1 Field Duplicates	Volatile CHCs Semi-Volatiles

Sample Handling and Receipt	Yes/No	Comments
COC completed adequately.	Yes	Acceptable.
Samples received by laboratory intact and cold.	Yes	
Date(s) Sampled: 24/01/06	Date Received at laboratory: 25/01/06	

Sample Holding Times	Yes/No	Comments
Samples analysed within appropriate holding times per analytical methods.	Yes	Acceptable
Date(s) Sampled: 24/01/06	Date(s) Extracted: 27/01/06	

Method Blank (MB), Rinsate Blank (RB), Trip Blank (TB), Field Blank (FB), Trip Spike (TS)
(MB) taken form all Batches. (TB, RB, & FB)

Type	Comments
MB	Acceptable. No Method blank result outliers occur the batch

Laboratory Control Samples (LCS)

Analyte	% R	Comments
Volatile CHCs / Semi volatile CHCs	36-116	Acceptable. No Laboratory Control Sample recovery outliers occur.

Matrix Spike (MS)

Analyte	% R	Comments
Volatile CHCs / Semi volatile CHCs	93.6-103	Acceptable. No Matrix Spike recovery outliers occur.

Duplicates — Duplicate taken from WG206S

Laboratory Duplicates	RPD %	Comments
Volatile CHCs / Semi volatile CHCs	0	Acceptable. No RPD recovery outliers occur for the duplicate analysis.

Inter-Laboratory Duplicates	RPD %	Comments
One field duplicate -QC100 = WG208D		
Volatile CHCs / Semi volatile CHCs	0-37%	Acceptable. Three RPD recovery outliers occur for the duplicate analysis.

Intra-Laboratory Duplicates	RPD %	Comments
NA		

Surrogate Monitoring Compound Analyses

Analyte	% R	Comments
VOC surrogates	92.2-114	Acceptable within control limits
Acid surrogates	23-108	Acceptable within control limits
Base/neutral surrogates	33.6-115	Acceptable within control limits

Overall Assessment

Various samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly

The results of the QA/QC procedures indicate that the results of the chemical analysis can be relied upon for the purposes of the groundwater monitoring program.

Notes: %R = Percent Recovery, RPD = Relative Percent Difference, LOR = Limit of Reporting
%AveR = Average Percentage Recovery

Performed By: Norm Ronis
Date: 23/02/06

Reviewed By: James Morrow
Date: 16/03/2006

ES0600878
Field Duplicate Sample

Date Sampled			24/Jan/06	24/Jan/06	RPD
Sample Identification Number			WG208D	QC100	(%)
Analyte	Unit	LOR	Original	Duplicate	
Sulfonated Compounds					
Carbon Disulfide	µg/L	1			--
Halogenated Aliphatic Hydrocarbons (VOL)					
Dichlorodifluoromethane	µg/L	10			--
Chloromethane	µg/L	10			--
Vinyl Chloride	µg/L	10	140	200	35
Bromomethane	µg/L	10			--
Chloroethane	µg/L	10			--
Trichlorofluoromethane	µg/L	10			--
1.1.-Dichloroethene	µg/L	1			--
Iodomethane	µg/L	1			--
Methylene Chloride	µg/L	1			--
trans-1.2-Dichloroethene	µg/L	1	25	33	28
1.1-Dichloroethane	µg/L	1			--
cis-1.2-Dichloroethene	µg/L	1	262	312	17
1.1.1-Trichloroethane	µg/L	1			--
1.1-Dichloropropylene	µg/L	1			--
Carbon tetrachloride	µg/L	1			--
1.2-Dichloroethane	µg/L	1			--
Trichloroethene	µg/L	1	471	449	5
Dibromomethane	µg/L	1			--
1.1.2-Trichloroethane	µg/L	1			--
1.3-Dichloropropane	µg/L	1			--
Tetrachloroethene	µg/L	1	1220	1770	37
1.1.1.2-Tetrachloroethane	µg/L	1			--
trans-1.4-Dichloro-2-butene	µg/L	1			--
cis-1.4-Dichloro-2-butene	µg/L	1			--
1.1.2.2-Tetrachloroethane	µg/L	1			--
1.2.3-Trichloropropane	µg/L	1			--
Pentachloroethane	µg/L	1			--
1.2-Dibromo-3-chloropropane	µg/L	1			--
Trihalomethanes					--
Chloroform	µg/L	1			--
Bromodichloromethane	µg/L	1			--
Dibromochloromethane	µg/L	1			--
Bromoform	µg/L	1			--
Chlorinated Hydrocarbons					
1.4-Dichlorobenzene	µg/L	2			--
1.3-Dichlorobenzene	µg/L	2			--
1.2-Dichlorobenzene	µg/L	2			--
Hexachloroethane	µg/L	2			--
1.2.4-Trichlorobenzene	µg/L	2			--
Hexachloropropylene	µg/L	2			--
Hexachlorobutadiene	µg/L	2			--
Hexachlorocyclopentadiene	µg/L	10			--
Pentachlorobenzene	µg/L	2			--
Hexachlorobenzene (HCB)	µg/L	4			--
Miscellaneous					
1.3.5-Trichlorobenzene	µg/L	2			--
1.2.4.5-Tetrachlorobenzene	µg/L	2			--

Notes:
-- = Result < Limit of Reporting (LOR)
- - - = No result for this analyte
RPD = Relative Percent Difference
Concentration between 10 & 20 times the LOR, 0-50%, >20 times LOR 0-20%
NA = Not Analysed
mg/kg = milligrams per kilogram
mg/L = milligrams per Litre
µg/L = micrograms per Litre